

Sangeethachandrika
(The moonlight of music) Part 1



Attoor Krishna Pisharody

English Translation and transliteration with commentaries Dr *Suvarna Nalapat*

1. *Naadaprakasam* (The light of sound/ Revelation of sound)

Mangalam (Auspicious *sloka*):

Om Nadabindusakthyaakhyasanthabhedena bhaswathe

Namaschidaanandamaya brahmane jagadaathmane

Bhashya : Anugrahnanthu vignaanakumudodbodhanendava:

Gurudevahridaambojakarunaamrithabindava:

The commentary is then logically explained by quoting the the verse from

Naradamuni (*Chaithanyam sarvabhoothaanaam vivrutham jagadaathmanaa*

Naadabrahma thadaanandamadwitheeyam upaasmahe) and words of *Sankaracharya* from *Prapanchasara* .

(1 saa thathwasamgnaa chinmaathrajyothishassannidhesthadhaa

Vichikeershurghaneebhoothwaa kwachidabhyethibinduthaam

2. *Bindosthasmaad bhidyamaanaa dravovyakthaathmako bhaveth*

Sa ramasruthisampannaissabdabrahmethi kathyathe

Thadvistharaprakaaroyam yathaa vakshyaami sampratham

Avyakthaadantharudithavibhedagahanaathmakam

Mahannaamabhavethathwam mahathohamkrithisthathaa

3. *Akaaraschapyukaarascha makaaro bindureva cha*

Naadasakthischa saanthascha tharabhedaassameerithaa

There are 7 parts for the *Pranava* sound . They are a, u, m, naada, bindu, sakthi and santham. *Pranava* is the form of Brahman and is also the word or name denoting/designating Brahman. There does not exist the differences of the designated or said *vaachya* and the designating or the word for it , the *vaachaka*.. The form and name are not different. That *nadabrahman* is the internal soul of all elements, of all universes, cosmos, the light of life in all living beings and the dense bliss experienced by all living and nonliving . This seen world and cosmos is only a manifestation of that Brahman. The 7 parts of Brahman and the causal root of 7 swara for music and the concept that the seven swaras originated from the omniscient *Anahathanada*, *Pranava*. Parts are not different from whole. This order of origin of sound and the cosmos is common for *Thanthra*, *Veda*, *Yogasasthra*, *Jyothisha*, and music . Therefore it is very clear that Indian science had an integrated and holistic very practical educational approach. This integration is reflected in the *Advaita* concept of India .

4. *Sameekhshya poorvasasthraani prayogaan pariveekshya cha*

Thanyathe krishnachandrena laghusangeethachandrikaa

The ancient sciences , their modes of practice etc are learned and experimented by *Krishnachandra* to write this work “*Laghusangheethachandrika*”.

This is the introductory *sloka*s of the work. In the last *sloka* poet gives his name (*Mudra*) as well as the name of the book. *Chandra* is not different from *chandrika*. (moon from moonlight) . Original *Krishna* of the lunar race and his *Brihad sangheethachandrika* are not different from the Poet *Krishnachandra* and his *Laghusangheethachandrika* since the *Atman* is not different from Brahman. Both

moon and moonlight are pleasing (Hladini power)and by Roopaka alankara in the word sangheethachandrika the pleasing nature of music with moonlight as well as its oneness with Krishna (God) is also pointed out. The term Laghu indicates that it is an abridged form or version of an earlier existing text Brihat Sangheethachandrika .

Here the poet gives names of some of the ancient works and authors he has referred for writing the work.

Sadasivan, Sivaa(consort of Siva) , Brahma, Bharathamuni, Kasyapa, Mathangha, Yaashtika, Durga, Sakthi, Sardhoola, Kohala, Visaakhila, Dathila, Kambala, Aswathara, Vaayu, Viswaavasau, Rambha, Arjuna, Naarada, Thumburu, Anjaneya, Mathruguptha, Raavana, Nandikeswara, Swaathi maharshi, Binduraja, Kshethraraja, Rahula, Rudrata, Nanyabhoopaala, Bhojabhoovallabha, Paramardhi, Soma, Jagadeka Maheepathi, The three commentators (Lollata, Ulbhata and Samkhuka) of Bharathi, Bhatta and Abhinavaguptha, Keerthidhara, Sarngadeva, Somanatha, Raghunathamahēpathi, Parswadeva, Kalleenatha, Akalanka, Ahobila, Purandaraguru , Ramamatya, Venkatadeekshitha, Govindadeekshitha, The king called Balarama (probably of Travancore)are some of the names mentioned. The last line speaks of several others who are not mentioned by name (*Sangheethagranthakarthaaro bahavo anye cha visrutha*). Upto this , is the introductory part given by the author . After this the author starts to speak of the speciality called Sabda, its general characteristics, differences and varieties etc .It is the speciality of music which gives bliss to heart with its different parts like dwani, vadya and their mela (union).

Soothra 1 *Srothragrahanayogya sabda:sa dwividha:*

That which has cognitive potential and power to be perceived by ear is called sabda or sound.

The ear (srothra) hears sound. That which is cognized by the sense organ called ear is Sabda or sound. It is that which is perceived by the cognitive power of ears .Sound or sabda is broadly divided as Aahatha and Anaahatha .

In Anaahatha sound the ear is unable to cognize or perceive sound. Because the sound atoms (sabdaparamaanu) are too subtle and small .They are not gross. Yet they do have the subtle form with potential cognitive power and hence they are also sound or sabda.

Soothra 2:- *Moorthaabhigaathadaahatha:*

Two objects which are gross meet or strike against each other and produce sound called aahatha. This meeting or union of two gross objects itself is of two types which determine the type of sound. One is abhigaatha and the other is nodhana.

Abhigaatha is a sudden and quick union and is used in many instrumental sounds. When the two objects come closer and closer very slowly smoothly and they unite or merge (layana) it is called nodana. The vibrations of sruthi come closer in a graded slow way and undergo layana between each other in vocal music and vocal music is nodana.

Which are the gross objects that produce sound ?

Soothra 3:-*Prithweteejalathejovaayavasabdascha moorthaani*

The five elements are gross. All the subtle and gross soundwaves travel/move, leather in aakaasa, and therefore aakaasa, the element, is called sabda.

Prithwi:-metals like iron, brass, etc are belonging to prithwi; stones, wood, sand, skin and bark, bone and horn, coir/thread/ropes etc are also considered as prithwi. Any sound produced by them is sound of earth.

Jala: water in river, ocean, rain, clouds, ice crystals and water vapour, smoke, gases dissolved in water are belonging to jala and sounds made by them are watery sounds

Thejas:-Agni or fire, electricity, sun and the stars etc are thejas and the sounds made by them (including cosmic sounds) are sounds of fire

Vaayu: That which is inside body as Praana, Apaana etc and that which is outside our body as the monsoon winds, solar winds etc are vayavya (wind) sounds.

Ahatha sound is the kampana (vibration) produced by union of two things, the series of anukampana (vibrations following the initial vibrations), and their echoes. The union may be by the same type of objects or by different type of objects. Thus the samyogavishesha (type of union) and the vibhagavishesha (the type of object that unites to form sound) are the causes for the different varieties and modifications of aahatha sounds.

Soothra 4:- *vibhaagavisheshaascha*

If earth etc undergo division or fission suddenly the sound produced is called Vidarana. If the process is a slow one it is called visakalana or analysis. That is, sounds produced by chemical analysis etc. Vidarana produce aahatha sound. But it is not useful for creation of music. They do not give bliss or pleasure to ear or mind.

Soothra 5:- *sa cha vaayutharangavishesha ithi*

kechith. Asmaadighaathaadhivaagnisphulingo vaayutharangaaghaathaajjaayamaano gaganagathagunavishesha ityeke. Vaayununnonthareekshatharangha ityanye. Vidyutharanga ity pare.

Ahatha sound means a wave produced in air. Wave is made in water and it is a movement happening in water. Similarly when we strike on a stone, or a metal etc a wave of dwani is produced in the surrounding air. When two stones are struck together the wave produced is a agnisphulinga (spark of fire). When a wave in air strike on the air nearby, that neighbouring air also is becoming a wave. In this way, the sound wave has the quality of Gaganagatha (movement in the sky). We cognize spark of fire by eyes. We cognize dwani of wave of air by ear. It is everywhere just as the wave of electrical energy. In the anthariksha (between earth and sun) both the sunray and the wave of air move. The receiving organ is different. Therefore we perceive the same energy as different. Understand that they are not different, but the same energy perceived as different due to the medium of transfer and the media of cognition (sense organ). The difference in perception is only a relative truth- Not absolute.

Soothra :- *Moorthaabhihatho vaayusahakrithonaahathastharaangaakrithir vidyuthaa prasaratheetyaachaaryaa:*

Just like earth, water, fire and air sound also is a basic dravya. The subtle subatomic paraparamanu of sound (akaasa) is spread everywhere just as the subtle subatomic (paraparamaanu) of the other four elements mentioned above. The omnipresent omniscient series of paramanu of the sabda (sound) is anaahatha. Anaahatha sound is otherwise known as aakaasa in Sanskrit literature. When this unmanifested subatomic sound particle, by the help of air around the earth's atmosphere, forms waves in the air

,it manifests as aahatha sound .It is this which is perceived by ear. When several paramaanu join , the subtle subatomic particle become grosser and grosser. The same principle work as in earth,water etc. Therefore sound or akaasa is classified as a dravya in its aahatha form just like the other 4 elements .It is an adravya in its anaahatha form , not recognized by the sense organ as manifest gross sound.

Sound wave spreads quickly and moves quickly through the electrical wave but for it the help of vaayu or air is necessary.(Sahakaari kaarana or co-operative cause).Thus the scientists of ancient India considered nature of sound wave as energy almost akin to electrical energy which needs movement of praana or oxygen for its function to be manifested.

Narada says :- *Anaahathaad aahatho maruthaanunnassarathi vidyuthaa.*

From anahatha sound by initiation of the winds of praana the electrical impulse is generated which raises up as manifested sound energy which is cognizable by sense organ.

Anaahatha is the Upaadaana cause. Influence of vayu is the nimitha cause.Ahatha moves through and as an electrical impulse in cosmos as manifestation of energy .

Both cosmic sounds and sounds of this earth (vocal, instrumental and natural sounds) are thus scientifically explained and analytically .Sound waves are subtler than waves of fire (Thejas) or light waves .Therefore they are lesser in weight than light particles.These subtle waves are powerful to move our nervous system into strong electrical impulses only with help of oxygen (praanavaayu).

Distant sounds are heard by ear after a time lapse it is produced. The reason is- the wave reach the ear after a time lapse.The Indian subcontinent with its special geographical location and its clockwork monsoon climate , bringing lightening, thunder and rains in rhythmic periodicity , its proximity to the ocean and the periodic tsunami waves and floods have been watched by our ancestors for millions of years before they formulated such theories. The comparison of cosmic energy and musical sound waves with its rhythm happened naturally because of the geographic location. This was not available for other ancient civilizations like Greece and Rome so that they had to depend upon Indians for understanding the natural laws .

Soothram 7 :- *sa punaschothram pravisan manassamyogena sraavanabudhigocharo bhavathi*

The sound wave enters ear.It sets in motion an electrical energy (which is an impulse) and thus joins (samyoga is union) with the mind. (Nervous system is here considered as seat of mind by the ancients).The external sound energy as an electrical nerve impulse creates a mind process of cognition of sound.The power of sound cognition is thus the intellect of the ear. The intellect or nervous system in the center of forehead between the 2 eyebrows is activated by the vibration of this and this cognition of sound with the ear which listens to sound along with center of the frontal cortex for such cognition is the Sraavanabudhi (Intellect of the ear).When we are engaged in other activities without proper concentrated listening , though the sounds are still there , they do not vibrate our mind or intellect and we do not experience/cognize/ understand the sound or its meanings .Therefore concentration and Manassamyoga (union with mind) are prerequisites for intelligence of the ear. Similarly if a nervous pathway from ear to brain center is impaired by some reason , we do not hear sound

.The hearing depend upon so many different factors. Since sound waves spread through electrical currents , when the sound is away from the vaayu(air) around earth (beyond earth's atmosphere) union with vayu being reduced /diminished or totally absent as the case may be the sound become less perceivable by naked ears .More concentration is required to cognize such cosmic sounds. All these being relative faculties for different beings differences in power of perception ,hearing, listening, concentration,analysis by brain do happen and usage of sound energy in different living things and in each individual human being is also different .Each of us is a unique person with unique and different type of musical intelligence and music therapists when they assess Musical life panorama should pay proper attention to evaluate each individual separately.

Why are some sounds pleasing and others not ?

Soothram 8:-*Madhuraadeenaam rasanaadyaanugunyavad*

srothrasiraanugunaparispanadakathwe : susrava:thikthaadeenaamiva vaigunyedrisrava:

Sweetness creates parispana or vibration of the vessels and nerves of tongue. Smells does the same with nose .In this way according to the quality of the sensory organ , which is the receiving end, the sensation which the parispana (vibration and movement of one point to next neighbouring point as in a wave of electrical impulse which is sound wave) causes pleasure to that organ . If sound waves are soft it gives bliss and sweetness to ear. If harsh, metallic it is harmful . The sour hot tastes for tongue , bad smell for nose, etc give displeasure and pain to those sensory organs . Similarly, a stressful and harsh sound gives displeasure and pain to ear and is harmful. Loud, harsh, sudden , explosive type of sounds which give abnormally high waves give only harmful effects to intelligence of the ear. It damages the sense organ and its cognitive powers.

Generally , nature of nervous system is same for all individuals. Yet individual differences do exist and we find some people loving sweet melodies and others harsh explosive types. Bhagavad Gita says that sathwik quality people like sweet , rajasic hot and sour , thamasic polluted ones. The taste for music also is thus different . Some people do not like music or chime of temple bells but love fireworks, bombblasts, etc. Sometimes it is familiarity to such sounds which creates this preference. Loud harsh sounds , explosive metallic sounds etc are naturally harmful to all ears , whether the people like it or not . When sensations are aroused in a abnormal excessive manner , nervous system vibrates to maximum , its capacity saturated early and beyond their ability the organs get tired of even a liked/loved familiar sound . Thus , one's taste changes with time.

Soothra 9:*Vaigunyam roopakalavaishamyaabhyaam*

Another reason for displeasure and pain of ears by sounds is mentioned. The dipleasing nature of the sound itself can cause pain. Or displeasure may be caused by disharmony of the rhythms of sound waves .

Nature of sound : When a coconut shell is rubbed against a hard stone ; the high sounding cry of a lion, Apaswara in music etc creates tension and stress to ear and thus pain .This depend upon the differences in the audience/ listeners too. Therefore they are called Roopavaishamya .

Kaalavaishamya is that which is unsuitable to the rhythmic time. One unit (Maathra) is the time (Kaala) for uttering 8 Laghu letters. When such kaala is prescribed in music , instruments etc , its double as 16 letter time (aksharakaala) half as four letter time, its half as two letter time are suitable .

2..4..8..16..32..64.. etc .

Those that does not come within this time interval series , as Mukhaari , Eduppu etc are avathaala or unrhythmic, and considered as kaalavaishamya. If a meter is wrongly used that also come under the category kaalavaishamya. These produce tension , stress and pain to ear.

Roopavaishamya produce stress and pain immediately as it reach the ear.

Kaalavaishamya causes reaction after it reaches the brain/intellect . This difference exists between roopa and kaala vaishamya type of musical stress / tension/ pain.

Origin and nature of Aahatha sound is then described. Now, proceeds to how to divide it as two types generally.

Soothra 10:-*Vividha: sabdaprapancha : sphota naadascha*

All Aahatha sounds of the cosmos belong to two categories only . 1.Sphota 2.Naada
Our day to day conversations with their Varnaakshara (pronounced sounds) , sounds produced by cutting timber etc are not continuous series (sreni) , But have a beginning (start) and an end which might be abrupt. These are considered as Sphota. Playing on the veena ,striking a temple bell,vocal singing etc on the other hand , are continuous series (sreni) of sounds and hence termed Naada. Author of BaalaramaBharatha says sphota is sakhandha (broken) sound and Naada is akhandha (unbroken) sound . Wherever Naada exists sphota also exists. But wherever sphota exists Naada need not always exist. Therefore, Sphota is Vyaapaka and Naada is Vyaapya (that which spreads).

Sooktha 11 :-*Prathamavisesho dwitheeya hethu :*

Naada is sound produced due to specific type of sphota. The specific sphota is the cause of Naada and is the sound of fission of a Bindu. (A dense point in spacetime). Naada is the effect of that cause. Therefore Sphota is Ranana and Naada is its Anuranana (repetition of ranana following it in continuation as a series is Anuranana). What is the cause for the special dharma that produce Naada within sphota ?

Soothram 12:- *Thadvisheshe cha moorthaavayava daardyaadhi nimitha pareeshti.:*

Only in some sphota the special dharma that produce naada exists. By which type of gross material the striking/touching produce sphota , that gross thing and relationship of its different parts and its fixity and hardness is the reason for this special effect. The relation of different parts of cotton is very loose .That of parts of wood is harder and more fixed. That of stone is still harder and fixed. That of metal is hardest and fixed .Thus when the hardness and fixity increase , the sphota produced by objects vary, and special dharma of sound causation also increases. Nimithapareeshty means comparative examination and evaluation of such different objects , their fixed relationships between the parts of a whole and the difference in sound produced by such relationships. That means demonstration of such properties by instruments made of different material was practiced in teaching about sound and its vibrations and characteristics .

Examples of sphota alone, and both of sphota and naada are then mentioned.

Soothram 13: *Yathraikaabhighaathe naika eva moortha
parispandasthajjanyasabdatharanghaschaasmakhandapaathaadiva
jalatharangasthathra sphotamaathram .Yathra punarekonaiva thena
moorthaparispanadhadhaaraa tharangaparamparaa cha daarukhandapaathaja
paariplavaaschalatharangaparamparaavathathra sphotanaadou.*

It was earlier mentioned that sound is produced by friction between two objects. By a single friction a single vibration and a single sound wave occur .There only sphota exists.It is just like waves produced by a single stone thrown into still water. In pronounciation of a single varna (letter) in conversation only such a sphota wave is produced. This sine wave is the basic of sound .

Suppose we put a floating wooden object (say a boat/ ship) in water. It floats , sinks and makes numerous waves in a series according to its movements in water .In this way from the one manifested object , within its several vibrations , and following each of the several vibrations several sound waves in a continuous series is produced. Here both sphota and naada coexist. The first sound wave produced is sphota and all the following vibrations and series of sound waves are naada. Examples are playing a lyre, ringing a temple bell, singing a raga . These sound wave series are more than that produced when we play a mridanga or a madhala (percussion instruments) since metal wires in veena , metal of the bell are more hard and fixed in structure than the skin/leather used in percussion instrument.

In this manner the specific sphota creates specific naada.The cause and effect nature of specific sphota and series of Naada and the vibration of objects and soundwaves are now explored.

Soothra 14 :- *Thathra prathamaparispanadatharangou dwitheeyaadi
parispandatharangaanaam nimithee bhavatha :*

The first vibration is the effect due to the first contact/striking/union (which is the cause).The first vibration (as cause) produces a second vibration (its effect).In this way each preceding vibration is cause of the succeeding vibration. Similarly the first sound wave is cause of the second and so on. Without the first vibration a second vibration does not happen. Withou a first wave , the second wave does not happen. The power (Sakthy) or strength of the first vibration determines the comparative power of the second one. The measure of the first wave determine the comparative measure of the second and the succeeding waves. Therefore a vibration with a specific power leads to vibrations of a specific power gradation, and a wave with a specific measure leads to waves of a specific measure gradation.Thus in an orderly way, every vibration and every wave hasboth cause and effect property within them.

Sooktha 15:-*Parispanadasyaiva tharangam prathi hethunaa, na prathamaaadhi
tharangasyaapeetyeke*

This view is given by some authors.

The first vibration (cause) leads to the first sound wave (effect)

Second vibration leads to the second sound wave.

Thus each vibration is cause of a succeeding wave .Similarly since the special type of striking and special type of object stricken also are cause of the comparative power of vibrations, and since the first vibration is cause for second and second for the third , and so on ...The first wave called sphota and second wave series together called Naada are all vibratory manifestations .Sphota also is part of the Naada , inseparable

from it .Sphota does not have an earlier wave as its cause. It is the primary cause for all the series of Naada waves.

The opinion that sphota is part of Naada is not logical , says the next soothra.

Soothra 16:-*Saamaanyahethoravyabhicharithathwaan prathamatharangasya*

sphotathaa: Parimaanathaarathamyaanuroodhaadanyeshu

poorvapoorvasyothararahethuthaa chetyanye

Without the first contact /striking the first manifested vibration do not occur. Without that the next sound wave also does not happen. Wherever there is a vibration is manifest, we therefore infer that there had ben a sphota. Therefore generally the manifested vibration and waves generated by spota has cause and effect relation.

Simply because there are several vibrations in certain places of first contact , we cant say that the first wave is not sphota , or that it is part of naada that is not present elsewhere. (The first vibration is a general cause) The first vibration produce the first effect of the sphota. This view is logical. For example , rubbing a coconut shell on a stone , and in our conversations the varna sound produced is different (Vaijaatya).

Sphota is everywhere . (*Sphotakhyo nityasabdo niravayavo* according to Sankara).

Where Naada is produced , the first wave is always sphota. That being the cause of the second vibration, and second to the third, the measurement of the wave gradually decreases .That itself is considered as logical proof for the view. In conversation the Varna sabda as sphota does not produce the wave series (harmonic series) of the Naada . But sphota is definitely there. Therefore it is not just a part of Naada .It is the cause for all sound waves called Naada. This is the logical approach to creation (srishti) and origin of sound and of the Universe .

Sooktha 17 :-*Kramaanmoortha parispandaanaam sphotaviseseshanaadayogascha pratyekahethu hethumad bhavo yuktha .*

Since there is general cause and effect relationship between manifested vibration and the sound wave, which is common to the sound and varna etc , each vibration produce a wave in each position of the Naada series. Since by a single friction a series of vibrations are produced and set in motion the power of the vibrations decrease .Therefore a specific force of first vibration should cause a specific force of the second , third etc ‘

In Naada , thus, the position is important -the earlier vibrations are causes for the later vibrations in successive order of their position. The power of vibration, and the nearness of the wave has cause and effect relation and the comparative measurement of the waves happen at the positions of the naada .Therefore for getting comparative measurement of the wave , we need not accept that each wave has the causal relation to the later- succeeding- wave.Just accept that a specific sphota is the cause for a sreni or series of waves called the Naada, in a specific cause and effect relationship.

Since the cause and the effect are not one, specific sphota (causes)is not a part of the Naada,(effect).This is logical.The lyre,bell etc are producing series of flow of vibrations (both sphota and naada)due to the union of their parts and its fixity, hardness etc. But in vocal sounds (produced from sareera or body and hence called saareera) in conversation there is no Naada .But on the other hand in musical melodies (Raaga) there is Naada .How is that possible ?

Soothram 18:- *Saareere sabdavaahineenaam siraanaam saithilyena daardiyena chobhayam.*

In ordinary conversation, the vessels carrying the sound energy need not be very strong and are very loose. Therefore the friction, content, and union of praanavaayu (oxygen) in them also is weak and produce just a single vibration. Hence only a sphota is produced in spoken speech.

In music, the vessels which carry sound energy are very strong, united in a hard fixed relationship, and the oxygen unites within, causing a series of continuous vibrations and waves of a harmonic series and both sphota and naada are present. According to the Anatomy of Indian scientists the voice is produced by praana (oxygen) uniting and causing friction within the hollow vessels of the body that carry praana. When they are strengthened, their interacting number of molecules also increase, and thus Naada gets the specific Mandra, Madhya and Thaara differences. This will be explained in detail, later. Now the different types of Naada produced by contact /striking are enumerated.

Soothra 19:- *Sookshmasthoolabhedaa dwividho naada : aadyovyaktha : dwitheeyo vyaktha:*

There are two types of Aahatha sound produced by contact between two objects. One is the subtle or sookshma. The other is the gross or sthoola. The first is unmanifested and the second is manifested. The unmanifested sookshma sound is inaudible to our ears. The manifested gross sound is heard by our ears. Both these are Aahatha sounds. Anaahatha sound is different from the subtle Aahatha sound, though both are inaudible.

Soothram 20:- *Thaarathamyaadhaadyasthryavastha:*

The commentary says one has to add sookshmathraya to the soothra. This clearly indicates that the Sanskrit sooktha is not composed by the author, but only the Malayalam commentary is his. If the soothra was composed by him, what is the need to say in its commentary that the word sookshmathrayaa should be added to it. According to grade of subtilty three states are there.

1. The subtle (sookshma)
2. subtler (sookshmathara)
3. Subtlest (Sookshmathama)

The subtlest is the first and its nature is described with the order of creation of the cosmos and its nature is described in the science of Vedantha (See Sudhasindhu commentary for the cosmic descriptions).

Soothram 21 :- *Thathra naadothpaadanechaayaam madhyaabhidhaanachakrasthithaantharagnyaahathe brahmagranthijavaayou thena thathratyaantharikshe vaa srishtyunmukhaprakrithou bindusampaadakamivaathisookshmam yadanaahathanaadasya chalanam jaayathe, paraasakthiroopathaadrisaprakrithisaamyathadamsathwaadwaa paraa samgnaa thachalanaavasthaa sookshmathametyuchyathe.*

The nature of the first Naada which is the subtlest :-

When the desire to produce Naada arises, the internal fire below the middle (Naabhi) strikes upon the air in the wheel of the middle (Nabheechakra or Manipoora) called the Brahmagranthi. Therefore in the stricken or moved air, a subtle vibration is produced which causes a subtle vibration in the Anaahatha subatomic Naada particles (Naadaparamaanu). According to science of Vedantha, when desire (Icha) for cosmic creation starts its function, Brahman (God), the nature (Anaahatha) which is

the form of an illusion (Maayaroopini) has a subtle chalana (movement) so that a dense Bindu (point)is formed for the sake of creating the Naada prapancha . That prakrithi which is Paraasakthi (absolute energy) and is upturned (Unmughi) has similarity to that which exists (sthithi) and also is the effort to create a specific Naada, and is the beginning of the Naada's form . It is called Para and that state of Naada is the first and the subtlest state of Naada.

In the illusion called Prakrithi there are orderly creation of the five elements . Budhi, principle of Naada, Anthariksha, thanmaathra of touch, vaayu,thanmaathra of form , rajas, thanmathra of Rasa, water, thanmathra of fragrance , earth – in that order. The five elements are in prakrithi which is interested in creation and that Nature is called Paraasakthi in both Saamkhya and Vedantha literature.

Soothra 22:-Thatha:kinchidoordwam gathe tharangaroopathaamaapaadyamaane thasmin bindwaathmanaa parinathaayaam naadonmukhyaamiva prakrithouyovasthaavishesha:swavishesharooponmughathayaa pasyanthee samgnaa saa dwitheeyaa sookshmatharavasthaa.

After that, those atoms of sounds, condensed due to their specific movement (velocities) through Oxygen (Praanavaayu) itself starts ascending and spreads to the heart. This spread starts the formation of wave form , and also the velocities of the waves which become the cause for the special types of Naada called Mandram,Madhyam and Thaaram. That special movement of atoms, which has spread above the Nabheechakra, and is about to form the wave forms of sound, is equal to that particular state in Prakrithi (nature) which has already transformed into dense Bindu and is about to transform to form of Naada. Since it is turned (unmukha means face raised up to something) to different types of wave forms creation, the ancient teachers have called it Pasyanthi . This state of Naada is the second Sookshmathara or subtler state. It is looking at the states of wave movements that form mandra, Madhya and thaara. The nature of the third sookshma state is now described.

Soothram 23 :- Atha hridayagathe thasmin mandraadihethubhoothatharangakramavaijaatyamaapanne yoginaam sravanagochara:pareshaam dhyanagocharascha madhyamaasamgnaa sookshmaavasthaavishesha :

After that the movement spreads to heart as a wave. This spread is in the order of speed of movement of waves which creates special Naada forms like Mandra, Madhya, Thaara, Udaatha, Anudaatha, Swaritha etc and special Sphota forms as well. The sound reaching the heart is heard by a Yogin even with his ears .If one do japa of Pranava in proper manner , and do praanaayaama to make the oxygen very strong, the pranava though usually inaudible to human ear , become audible according to Yogasaasthra . For ordinary people this is impossible. Yet , they can do meditation on the mandra, Madhya, thaara forms by differentiating and meditating on their nature (which is done by music lovers).A musician can express these , only if he/ she has done proper meditation with concentration on them. The vocalist, the vedic performers, instrumentalists like the veena players etc all produce these sounds only after concentrated meditation only. Since they are between the vyaktha (manifested) and avyaktha (unmanifested) Naada states they are called the Madhyama (

Middle). This madhyama state is the sookshma state . After describing the three states of the sookshmanaada , the nature of the gross sound is described .

Soothram 24 :-*Punassabdavaahineeparikampapoorvakam kandagathe thasmin vaikhareesamgno vyaktho naada ithi.*

The subtle sound from heart spreads ascending to the neck and vibrates the nerves (Naadi) which are the carriers of sound (sabdavaahini) according to velocity of each of the wave movement and brings it out through mouth and then it becomes the gross sound heard by every body . This gross sound produced from the neck is termed Vaikhari by ancient authors. Thus Naada has the four transformed states in order .

About this Sankara has said :

Moolaadhaaraath prathamamuditho yasthubhaava :paraakhya:

Paschaath pasyanthyatha hridayago budhiyungmadhyamaakhya :

Vakthre vaikharyatha Rurudishorasya janthossushumnaa-

Badhasthasmaadbhavathi pavanapreritho varnasamgha :

The word Ithi in the 24th soothra shows the nature of the gross as well as subtle sounds has already been described.

In the sounds produced from human body the above order of subtle and gross sounds do exist. To clear the doubt regarding this order in a sound produced by a Veena the next soothra begins.

Soothra 25 :- *Veenaadaavapyevameva naadothpathikrama: Thadagnaanamapi vegaathisayaath*

In Thambura, veena etc also there is a first movement followed by waves of sounds etc happen so that first subtle naada and then only gross naada happen. But we feel that when a veena plays we hear the gross sound immediately . We do not feel the order described above. In case the subtlest, subtler, subtle, and gross is order we should hear sound after a time lapse when a veena is played. For this doubt , soothra says : Thadagnaathamapi “.It is unknown or unheard because of the very high speed (vegaathisaya) during the creation of order of Naada (Naadothpathikrama)..The sound whether in body or instrument is felt immediately for the perceiver , but the time taken for the sound waves to reach the ear is not felt .The high speed sound waves are not experienced by sense organs. Only the gross sound is experienced and the time lapse remains unknown due to the frequency difference of the waves. About this , the opinions of some ancient teachers is now cited.

Soothra 26:-*Athissokshmasookshmapushtaapushtakrithrimabhedaath panchavidho naada ithi nissankaadaya :*

According to Nissangasaarngadeva (author of Rathnaakara) there are five types of Naada : Athisookshma , sookshma, pushta , apushta and krithrima. Sarngadeva said : Athissokshmascha sookshmascha pushtopushtascha krithrima:ithi panchaabhidhaam dhathe “. The same is said by Paarswadeva , author of Samayasaara. Instead of Pushta and Apushta , Mathangamuni uses Vyaktha and Avyaktha . Pushta is Vyaktha and Avyaktha is apushta. The nature of these five types of Naada are :

Soothra 27 :-*Athissokshmo naabhiga : sookshmo hridayaga:pushta :kandaga:apushtassiroga:krithrimaschaasyasthaanavikaaraja:*

The subtlest is that which originates in the Nabhi . That which reached heart is subtle. (In between these two is subtler).That which reached neck is Pushta or manifested

sound. That which has to be expressed with the effort of the head is a thaara naada and it is called apushta or unmanifested. In the mouth the palate, cheeks, tongue, lips etc by contraction and expansion and with nasal tone the krithrima or artificial sounds are produced. This artificial sounds are used more in North Indian music. It is less in South Indian music.

Naabhihrithkandamoordhaasyeshwaavirbhaavayathi dwani and Ithi panchaabhidhaam dhathe panchasthaana sthitha kramaath are said about these by Rathnaakaram. About this subject there are other opinions as well. For teaching the students (for completion sake) these are mentioned.

Soothra 28:-sookshmapushtaapushtaa:kramaanmandramadhyathaaraa evethi kechith Thadayuktham.Krithrimasyaapi thathaabhaavena vibhaagavyaakhyaathaal

Mandra from heart, Madhya from neck and thaara from head is an opinion. Therefore sookshma is that in heart, means sookshma is mandra , pushta is Madhya and apushta is thaara according to some. But this opinion is not correct . The position of mandra, Madhya and thaara to heart, neck and head means in these positions , more effort has to be applied to produce these respective sounds. It doesn't literally mean that each originate in that respective place. It does not mean that each requires no effort at all in other positions. All naada are originating from Brahmagranthi as said before.

Therefore such interpretations are not suitable for either science or for experience. Not only that , even the mandra are becoming audible with the vibrations of sound carrying nerves near the neck . Secondly if sookshma , pushta and apushta means mandra , Madhya and thaara in order the mandra , Madhya and thaara comes in the artificial sounds as well and then the categorization of artificial as a separate entity will not be correct. The Naada are not classified as mandra , Madhya and thaara in this particular division into five types. Rathnaakaram says : Vyavahaare thwasou thredhaa hridhi mandrobhidheeyathe kande madhyo moordhni thaara :

In the broad classification of sookshma and sthoola (subtle and gross) itself are included the 5 types mentioned here. Therefore , one has to understand the words of the teachers is only a guidance for the disciples to understand the innumerable , countless Naada which can happen .

Soothra 29 :-Paraapasyantheebhyaamaadyasyamadhyamayaa dwitheeyasya vyakthena thritheeyaaadescha samgraha:

The subtlest Naada (athisookshma) is naada state in para and pasyanthi itself. Both states are mentioned as one here . Subtle (sookshma) is Madhyama state of Naada. Pushta, apushta and krithrima belong to Vaikhari. Therefore they are the Gross (sthoola) Naada .For the gross Nada there are many different types. If one of the thridosha (vaatha, pitha or kapha) is prominent, or if two of them are prominent or if the three are equalized the body has different qualities of sounds. Similarly natural (sahaja) and acquired (Aaganthuka) changes in qualities of the eight places of production of sound also produce innumerable differences in gross sound of different individuals. The difference in gender , age etc also causes differences in gross sound. In instruments like veena, flute etc by the difference in the instruments, by the union of parts of each instrument etc innumerable sounds can be produced. Ancient teachers

say : *Uchaistharo dwanee rooksho vignevo vaathajai budhai: gambheero ghanaleenascha gnaathavya : pithajo dwani :*

All these are included in a single group as gross sound in the general classification given here. To understand the manifested gross sound used in music, one should know the comparative speed of sound waves and the comparison of strength of vibration (parikampabalatharathamya) since they are the co-operative causes in sound production. To prove this statement , the gross sound itself is divided as two types according to the power of cognition of ear of common man.

Soothra 30 :- *Soyam Naada:*

parikampatharamgayorbbalavegatharathamyaadyogyogyascha

The gross sound thus produced are of two kinds – that which is audible and that which is inaudible. This depends upon the strength or weakness of the gross vibrations which are cause for the sound , and also because of the comparative speed and frequency of the sound waves produced by them.

Moorthaabhighaatha : a slight movement of the tongue ,just touching a string of veena etc. In them a gross vibration is produced oly very slightly , and that produce a small sound wave. But the vibration has no strength and the sound have no adequate measurement (parimaana) to make it audible.The laws governing the ear and its audibility as ordered by nature/God should be there for a sound to become audible for our ear.If a sound wave is lesser frequency or higher frequency than what is cognizable by ear, that sound wave is inaudible. Because of cognition powers of ear , some sounds inaudible to human beings is heard by other animals. The speed of wave , its comparative slowness and fastness depend upon the measurement of time (Kaalaparimaana). Therefore to understand the frequency of sound waves one has to first understand the science of time measures and its laws.

Soothra 31:- *Avyavahithalaghuaksharocharanakaalo nimesha : theshtou kashtaa.*

Thaasthrimsath kalaa. Thadashtakam kshana: the dwadasa muhoortha : The thrimsadahoraathra ityathra kaalaparimithi.

Nimesha : It is the time required to utter or pronounce a short syllable like Ka, cha, ta, tha, pa etc when one utters these with uniform speed quickly without an interval between them . As kachatathapa. Laghu akshara is the Ka cha tat ha pa here. To utter the swara (vowel) like that a, a, a, a ..more time is needed and thus one letter in it is not uttered with one nimesha.

Kaashta:- 8 nimesha constitute one kaashta.

30 kaashta = one kala.

8 kala = one kshana.

12 kshana = one muhoortha. That is two naazhika

30 muhoortha makes one Ahorathra (one day and night) . This is the science of time division .

One nimesha is $1/8^{\text{th}}$ of a second .

Now we have to see the speed of gross vibrations and of sound waves according to this time division.

Soothram 32 :-*Thathraikasmin nimeshe parikampatharamgaanaam chathushtayodaa panchasahasramulpathou sravanayogyathaa nyoonaathaayaamaadikye cha thadayogyathaa.Martyendriyaanam parimithabalathwaath.*

In one nimesha if any number between 4 to 5000 is the speed of vibrations and sound waves, the sounds are audible. If it is below 4 or above 5000 it will not be audible.

Apart from the strength of the sensory organ and its laws, there are some other requisites for hearing sphota and Naada, and when the number is less or more than what is normally within a Nimesha, even these requisites are lost. To show this the special nature of vibrations which produce sound waves is described in next soothra.

Soothra 33:- Srimghalithabandho yogyanaadaparikampa:

If vibrations have to form continuously as a series, so that sound waves are created, the relation of the object should be hard and fixed as said before. Because of this relation, the vibrations which produce audible sound, just like a chain with its parts intertwined as if a twain is formed. Therefore the vibration in the nimesha, if less than 4, the object (say a string of veena) is loose. Similarly if it is more than 5000 the string is very tight and hard fixed. It is this which makes such sounds inaudible. Now let us see the relationship between speed of vibration and the state of the Naada.

Soothra 34:- Parikampavegathaarathamyaannaadochaneechabhaava:

In a nimesha, as the number of vibrations increase, the speed of sound waves also increases. When sound waves are more speedy, naada become more and more loud, and when it decrease it become lesser. Therefore, the comparative speed of the sound waves give the sound its Ucha (loud) and neecha (low) nature. In this uchaneecha order lies the similarities and differences of the Naada. (saajaatya and vijaatya)

Soothra 35:- Parispandatharangasamkhyanaam dwidwigunaanaam naadasaajaatyahethuthaa:

There is a special quality to be understood for the louder or softer sound produced by the number of vibrations whether in the nerves of the vocal cord or in the strings of the veena. When the number of vibrations increase per Nimesha (1/8 of a second) and the fixity and hardness of the object increases, it becomes twice the number of the just previous number of vibrations. This sound and the first sound produced will belong to the same class (Saajaatya / sajaatheeya). Each sound depending upon its high or low nature (due to change in vibrations) has the ability to create different subtle emotional changes in our hearts. Not only for Naada but also for the sounds of Varna (language), cry, and screams etc also has this power of creating a certain emotion. Depending on the special character of the different Naada they are generally classified as Deeptha, Karuna, Aayatha, Mridu, Madhya etc. A sound produced in a special number of vibrations per nimesha, and its next sound with twice the vibrations produce the same emotion and thus they are sajaatheeya. A sound produced by 50 vibrations per Nimesha, and by 100;200;400; 800... will be sajaatheeya. Those which differ from this number series will be vijaatheeya to these mentioned. Thus for any number of vibration there are sajaatheeya and vijaatheeya numbers and sounds with a different quality. The series of naadaparampara is eternal and so is the number of vibrations. From this we select a mandrasthaayi for which a Madhya and tharasthaayi depends upon the selected mandrasthaayi since they are sajaatheeya due to the relationship of twice the vibrations just mentioned. Sajaathi and Vijaathi means only a different quality in sound (and the fixity of relationship between objects) and this is true also of living things.

In the veena if we make the string not touching its Mettu, just based on Meru and Kukubha, and play on it a naada is produced and it has a specific number of

vibrations. All the series of Naada twice this number is together called a Sthaayi (Fixed). The vibrations from that twice number to its twice number is the second sthaayi. That number with its twice number is the third sthaayi. This is the order. In vocal music , the Naada produced by a particular number of vibrations of the vocal cord nerve (sabdavaahini) is made use of in singing a Geetha and any vibration and sound twice this number is of the same sthaayi or sajaatheeya . Thus twice the number of vibrations of the original number of vibrations is the basis for Naadasthaayi or fixity of Naada in musical repertoire. To prove or demonstrate this one has to use a string instrument like the Veena.

Soothra 36:-*Bahutharaamsasandhaanaghatithaa parikampasringhalaa*

The series of vibratory movements that produce Naada in a veena has a gross form like two threads are intertwined in some places and have an order in parts of that area and many parts with vibratory movements intertwined between them . All these parts are said in an order as the small one within larger one, in a descending way . The important forms of such joints (sandhi) in the vibratory series of chains are many. Two of them are said .

Soothra 37:-*Madhye mahaasandhirmadhyathaarasthaayibhedaka:Thasya cha bhaagavayam sarvaamsaparikampasamkhyaaatho dwigunam swayam prithak parikampathe*

A vibrating string of the veena has a length between kukubha and meru. In its middle there is a sandhi (joint) which separates this entire length into two equal parts. When entire length of string vibrates , both these parts vibrate simultaneously in twice the number of vibrations of the entire length. Therefore if in the entire length , if Madhyasthaayi is Shadja Naada, in the Mahaasandhi position at the middle Thaarasthaayi shadja will be produced. The Mahaasandhi position thus distinguishes Madhya and thaara sthaayi. At that position we can hear the sudha (pure) Thaarashadja naada. This naada is called Swayambhoo Naada by ancient teachers.

Soothra 38 :-*Thathaa thrichathushpanchashadaadrimsavibhaajakaani cha sandhaanaani .Thathad bhaagaanaam prithag thathadgunaparikampaascha yathaayathamantharamantharbhavathi.*

The length is divided into three parts by two joints . With general vibration of the string all the three equal parts thus formed vibrate at thrice the number of the original vibration. Even if we close the joint with a finger , we get a swayambhoo naada from the joints. It is thaarapanchama , not thaarashadja .It is louder (ucha) than thaarashadja. The reason is that when the number of vibrations increase the loudness also increases. If we divide the vibratory string and its vibratory chain into 4 equal parts with 3 joints, each of the part vibrate 4 times than the original vibration .The swayambhoo naada produced by these three joints , will be Thaaratharashadja . The middle joint among the three joints is the same joint which divide the entire length into two (mahasandhi) and there we get thaarashadja itself. The thaaratharashadja merges in it. Since the vibratory strings according to the comparative measurement are one within the other this merging is natural.

If we divide into 5 parts with 4 joints the vibrations will be 5 times the original number. In all the 4 joints antharagaandhaara of the thaaratharasthaayi is produced. In 6 part division with 5 joints , 6 times is vibration and thaaratharapanchama is the swayambhoo naada.If 7 parts with 6 joints, 7 times is vibration, and

thaaratharakaisika is swayambhoo naada. Similarly one can divide into 8 or 9 in order. Since strings of these joints come one within the other , and since swayambhoo naada are produced at these positions , when the parts are increased (more the division) the swayambhoo naada at each joint become subtler and subtler . Thus the string instruments demonstrate and teach the subtle naada and their vibratory position, number of vibrations which render a particular quality etc.

Soothram 39:- *Ethena sthaayithadantharanaadabhedopi vyaakhyaatha :*

From the description of the series of vibrations , the form of a fixed (sthaayi) naada and the form of all naada which come within a sthaayi naada are understood. Both depend upon the measurement of vibratory numbers per nimesha. From a naada produced by a particular number upto its twice number the entire series of sounds is called a sthaayi . Each naada in that series is the internal naada of that sthaayi. There is a law that one should accept that vibratory number with which a sthaayi series starts , that naada may be considered as shadja. From shadja to its sajaatheeya shadja is thus called a sthaayi. Suppose one takes a naada with 50 vibrations as beginning, then that naada is called or determined as shadja of that sthaayi. Then a shadja which is sajaatheeya and has 100 vibrations is the series of that sthaayi. From 50 to 99 vibratory naada are all the internal Naada in that series.

Suppose one takes the beginning as 52 vibrations as shadja. Then 104 is the sajaatheeyashadja. Like that one has to understand the vibrations and the naada series. Rishabha , Gandhara etc come within the internal naada of such shadja .Suppose you make the vibrations of the rishabha position of one series as the beginning , then it naturally becomes the shadja and all other naada become its series only . Suppose 50 is the beginning shadja vibration and 100 is mandra, upto 200 is Madhya and 400 is thaara .800 is thaarathara .

Soothra 40 :- *Naasandhisthaaneshu swayambhoonaada :*

If we put our finger in places other than these joints , on the string no swayambhoo naada is produced. This shows that with intertwining of joints only Naada is produced. And the vibrations need such intertwining pattern of sounds . With increase in number of the parts , number of vibrations also increase. In vocal music, how are the sthaayibheda produced ? The logic behind it is explained.

Soothra 41:-*Saareere thu hrithkandathaluaadi prayathnavaijaatyena praanachodanaath sthaayiaadibheda:*

Vibrations of the nervous system produce sounds in the body. The reason for vibration is the fixity and hardness of the nerves and the flow of oxygen (praanavaayu) through it . The nerve of sound (sabdanaadi) is made fixed and vibratory and with different number of vibrations per nimesha by Heart, neck, palate, head etc which by the effort required to produce the sphota sound (spoken language) .But the praanavaayu (oxygen) flow required for the sphota effort and that required for the naada effort (music) are vijaatheeya (different quality).When fixity increases the number of vibrations also increases . If this effort comes from heart position the naadi has less fixity and vibratory number is lesser than the other positions. If it is at neck, the number of vibrations are more than that at heart position.If it is in palate it is more than neck. In veena the positions and joints are manmade . In human body the

positions are God-given but one has to acquire the quality by doing one's own effort or prayathna .To fix each of the position of swara human beings need special training and continuous practice. Effort at heart position gives a series of Mandrasthaayi, and its internal naada. Effort at neck position gives madhyasthaayi series and its internal sounds. Effort at thaalu or palate gives thaarasthaayi and its internal sounds.

Vocal sounds of different nature are heard. Some are snigdha , komala (soft and sweet) and others ghora , parusha (hard and cruel) . This depend upon the increase or decrease of the three humours – vaatha, pitha and kapha – which gives different qualities to the nerves which carry sound. This being a natural quality of body (prakrithi sidha) one may not be able to change it .

From the above mentioned scientific facts one has to think how many sthaayi are good for hearing and of them how many are useful for creation of music .That is logically explained next.

Soothra 42:- *Nimeshamaanena parikampaanaam chathushtayaadaapanchasahasram naadasya yogyathayaa sthaayidasakasambhavepi madhyagapanchaanaameva sangheetha prasanga:pareshaamathineechochathwaabhyaamaranjakathwaad.*

4 to 5000 vibrations per nimesha are all audible sounds. That means from 4 upto 5000 all sounds may be taken as a shadja and begin with it. But since the first naada of a sthaayi is that with a particular vibratory number and its twice number is the basis for one sthaayi in a suitable sound series there will be no more than 10 sthaayi.

- 1.From 4 to 8
- 2.From 8 to 16
- 3.From 16 to 32
- 4.From 64 to 128
- 5.From 128 to 256
- 6.From 256 to 512
- 7.From 512 to 1024
- 8.From 1024 to 2048
- 9.From 2048 to 4096
- 10 From 4096 to 4099

If 5 vibrations per nimesha is the beginning of the first sthaayi then it will be

1. 5-10
2. 10-20
3. 20-40
4. 40-80
5. 80-160
6. 160-320
7. 320-640
8. 640-1280
9. 1280-2560
10. 2560-5120

Similarly if it is 6,

- 1 . 6-12
- 2 . 12-24
- 3.24-48

4.48-96

5. 96-192

6.192-384

7. 384-768

8.768-1536

9.1536-3072

10 3072-6144

And so on. There will not be more than 10 sthaayi in a series of orderly Naada which is musically audible . In the first three sthaayi which are having very reduced vibratory rates, the differences between the swara and sruthi which are musically pleasure giving are difficult to be differentiated. The internal sounds in them are not manifested and hence not useful for music creation. Only in the veena the 5 intermediate sthaayi are useful . Even in those 5, the last part of the first sthaayi and the first part of the last sthaayi are only useful in music. The other have low quality of Ranjaka (pleasing) and not useful in music. In vocal music only three sthaayi are useful .

The names of the sthaayi of music are now discussed.

Soothram 43:- *The cha kramaad*

anumandramadramadhyathaarathaaratharasamgnaa:

The 5 sthaayi which are useful for music are named in order : Anumandra, Mandra, Madhya, Thaara, and Thaarathara. The lowest sthaayi is Anumandra and highest is Thaarathara.

Soothram 44:-*Aarabdanaadasaapekshaaascha*

Since the difference as anumandra to thaarathara is by doubling of the vibratory number per nimesha, which vibratory number is taken as anumandra determines the other positions. Therefore all sthaayi are relative (Apekshika) depending upon the vibratory number with which it starts . If 32/nimesha is anumandra in order we get 64 as Mandra, 128 as Madhya, 256 as Thaara and 512 as Thaarathara. If 40 is anumandra then the order becomes 80;160;320 and 640 and so on.

If 35 is anumandra vibration, the order is 70;140;280;560. Thus depending upon the starting vibration there are endless possibilities for these 5 sthaayi positions.

Soothram 45 :- *Aahathasyaayam saamaanyaprapancha :*

What is said here is about Aahatha sound and its general forms since they are the subjects to be briefly discussed and understood before entering the science of music. Aahatha has many other different forms depending on objects , the way it is stricken etc beside the differences discussed just now depending on vibratory rates. The gross abhighaatha (striking) is only a supplementary cause for aahathanaada.. The root cause is the samavaayi kaarana which is now said.

Soothram 46:- *Thannidaanamanaahathanaada ityukthapraayam*

The root cause for aahatha sound is Anaahatha sound.

Soothram 47:-

Hridayasthaanaahathachakragathavaayoragnyaahananasyaahathanaadahethuthwam muninokthamithi kaschith

That which is in heart and called Anaahatha is a 12 petalled lotus and in it the striking of the internal fire or energy produce the Aahatha sound. Therefore Anaahathachakra in heart position is a cause for aahatha sound is the meaning of

Narada's words (Anaahathaadaahatha) according to some authors of yore. Their view is that the timespace of sound production also is a cause for the sound.

Ahobilagrantha says :

Hridyanaahathachakresminnnilaanalayogatha:aahathasthathra naadassyaadithi saasthre prakeerthitham .

For the sookshma sound there are 4 different varieties like para, pasyanthi, madhyama and vaikhari and when sound reaches heart it is in madhyama state .

Soothram 48:-*Thasminnanaahathachakre dhyeyasyaanaahathanaadaathmaka pranavaroopasya shivasya sakalaahathanaadahethuthwamukthamityannye.*

As the one who resides in the Anahatha lotus in heart , and as the form of Pranava (Om) Shiva is the root cause for all Aahatha sounds is the opinion of others. The quotations from Nissangasarngadeva are :

1. *Hridayenaahatham chakram shivasya pranavaakrithe : poojaasthaanam thadichanthi dalairdwaadasabhiryutham*
2. *Thasmaadanaahatham naadam munayassamupaasathe*

Iswara has form of pranava and Anaahathanaada is Pranava. It is Naadabrahman.

Therefore it is cause for entire cosmos . Srinaradamuni says : *Chaithanya*

sarvabhoothaanaam vivritham jagadaathmanaa

Naadabrahmathadaanandamadwithheeyam upaasmahe .

In this way , pranava or anaahatha which is the rootcause for entire cosmos is cause for all aahatha sounds. In the soothra “ *Anaahathaad aahatho maruthaanunnassarathi vidyuthaa* ” the cause for aahatha and anaahatha are separately mentioned.

Soothram 49:- *Vasthuthoyamaahathahethuranaahatho vibhurantharikshaadisamjno nirvaathajaladhimaadhyagathajalaanutejonubhyopi sookshmasahajachalanaswabhaavo Naadabrahma sabda thanmaathravivartha bhoothavishesha ithi.*

The anaahatha sound spoken by Narada as cause of Aahatha is the omnipresent omniscient sound which like a collection of watery subatomic particles densely accumulated in the middle of ocean during a windless time, or a subatomic accumulated fire /energy particles spread everywhere, yet subtler than them and having a quality of movement (chalana) . It is the translated form of (vivartha) of the subtle element called Sabdathanmaathra which is produced from the Naadabrahman. It is a type of bhoothadravya (elementary matter) like prithweesookshmabhootha which is vivartha of gandhathanmaathra, jalasookshmabhootha which is vivartha of rasathanmaathra,thejasookshmabhootha which is vivartha of roopathanmathra , vayusookshmabhootha which is vivartha of sparsathanmaathra. All these sookshmabhootha are sarvavyapi (spread everywhere) .The paramaanu (subatomic particles) of these sookshmabhootha are lighter than those of Theja:paramaanu (light particles). Therefore Vidyuth (electricity) carry them. This Anaahathasabda is the bhootha which is also called Aakaasa and Anthariksha in Sanskrit language. Wherever it is spread , that space also is called Aakaasa and Anthariksha by looking at the lakshana (sign) of the sound wave spread through electrical current .

Aakaasasamgnitho naado yassonaahatha eeritham

Thasminnanaahathe naade vilayam yaanthi devathaa:

Yoginopi mahaathmaanasthadanaahathasamgnake

Mano nikshipya samyaanthi mukthim prayathamaanasaa

Is a quote from Sangeethamakaranda. When there is a abhighaatha , the anaahatha sound paramaanu unite in a particular shape , and become a wave form and spread just like water waves, and then when expansion is completed in the same order become less and less (contraction) and reach its original position and shape. This is the logical explanation of what Naarada said about Anaahatha and Aahatha .

Sruthiprakasaasam

Sruthigunasamsthuthacharithaa sithapadmasthaa suraasurairmahithaa

Veenaagaane nirathaa vaanee varadaasthu bhakthakalpalathaa

The endless sruthi and their beauty and differences which are the reasons for the different musical forms is now introduced. For this the author first explains what is meant by sangheetha or music .

Sootharm 1 :-*Geethavaadyanrithaani samudithaani sangheethamityaachaaryaa:*

Ancient teachers define sangheetha or music as that which is practiced by combining Geetha (melody), vaadya (instruments) and Nritya (dance). That which is samyak (with the parts equally blended) , perfect and bright Geetha (melody) is sangheetha. The thaala or rhythm which is a measure of time and function of time is conjoined in all these (vocal, instrumental and dance) and therefore not mentioned separately . Srinaarada says : *Geetham vaadyam cha nrithyam thrayam sangeethamuchyathe.*

Ahobila says : *Geethavaadithranrityaanaam thrayam sangheethameeritham*

Soothram 2:-*Prathamadwitheeye cha thathaabhootha*

The first said (geetha) and the second (vaadya or instrument) alone (without dance) is also sangheetha.

Soothram 3 :-*Praadhaanyaath geethamaathramapi sangheetham*

Since melody and instrumental music are more important than dance , it was said that sangheetha can be defined as these two alone , excluding dance in a practical sense. Among geetha and Vaadya , Geetha (melody) is more important than Vaadya . Therefore Geetha alone is Sangheetha .

Praadhaanyena vyavahaaraassambhavanthi is the logic behind this. Thus all born in the race of Raghu are called Raaghava , yet that name specifically denotes the most important of the race – Sri Rama. Sangheethapaarijaatha says :

Gaanasyaathrapradhaanathwaathalsangheethameritham

Soothram 4 :- *Thadhwividham .Maargam deseeyam cha .*

It has two types Maargam and Deseeyam . Sangheetham (with vadya, and nritya) has margi and Desi . Rhythm or thaalam being a part inseparable from music , it also naturally has a marga and desi .

Soothra 5:- *Thathra Maargasangheethamanaadi poorvarshidrishtam*

sarvadeseeyamoolam saamasrutyaadivyavasthitham cha

Maargi is that music which has a history eternal (anaadi is beginningless) the origin of which is in a remote past of the race and hence unknown . It was used and seen by the ancient sages of this geographic area and is just like the saamasruthi (Saamaveda) has a well defined and unchanged structure and laws .

Sangeetharatnaakara says : *Maarggassa uchyaathe , yo maargitho Virinchaadyai : prayuktho Bharathaadibhi:*

The ancient Maargi sangheetha later on gave rise to different types of Desi or regional music of the land and therefore is the cause of the regional music. The regional differences and changes came because of the time and taste differences of each of the regions and thus time and space differences gave rise to regional music. In Samaveda, Kapaalapada and Raagamoola we find the method of Margasangheetha. Sarngadeva says : *Saamavedaadidam sarvam sanjagraaha pithaamaha:*

Bharatha also said :- *Jagraaha Paatyamrigwedaatsaamabhyo geethameva cha .* Soothram 6:- *Deseeyam thu thadvikritham prathidesam vibhinnamanekavidham* In regional music, changes are made in saama music in sruthi, swara etc and in each region according to tastes, nature and customs of the people several differences have been introduced and they are innumerable .

Dese dese pravritho dwanirdeseethi samgnithaa and Abalaabaalagopaalai:kshithipaalaairnijekhayaa geeyathe saadhuraagena swadese desiruchyatha are the words of Mathanga in this matter.

Nissangasarngadeva said : *Dese dese janaanaam yadrichaa janaranjakam gaanam cha vaadanam nrityam thaddeseetyabhidheeyathe*

He also says : *Thadheseeyamithi praahussamgeetham desabhedatha:thadidham suswaraisthaanairoopetham sukhasaadhanam*

The kathakali music is different from Karnataka music. The Nandan Charithapada and Ramayanapada of Tamil Nadu is not same as Karnatik music or kathakali music. The music of Telungana is different from all these. The music, instruments and dance forms of neighbouring regions though all of them originated from the same maargi in distant past , have their own originality and differences from each other. This is true of South Indian and North Indian music as well . All regional music are called Vikrutha (which have been made unnatural) from the prakrithi (natural music) of the land , each has its peculiarity and place in cultural history of the vast land called India .

Soothra 7:-*Thadapi vaijaatyaaathisayatho Bhaarathe dwividham Dakshinotharabhedaath*

Regional music are of several types. Yet depending upon the maximum difference or vaijaatya , the regional music of India is broadly classified as North Indian and South Indian. All the regional music originated in South India is sajaatheeya. Similarly all the regional music originated in North India are sajaatheeya. This division is for the Indian music depending on the southern region and Northern region (Hence regional or Desi)

Soothra 8:-*Naadatharangasanchalanapradhaanam prathamam thalsamkalanapradhaanam dwitheeyam*

The south Indian music become sajaatheeya (similarity as a class) since it has the main character of movement of the sound waves. The different types of wave movements (sphuritha, aandolitha etc) are used to give bliss to minds. Because of the swara and naada waves movement , each of the melody has similarities as well as differences but main similarity is that all of them use sound wave movement for production of music.

North Indian music on the other hand fuse the sound waves in different waves and make them dissimilar and is essentially a fusion music. (sanchalana is movement and samkalana is fusion). In it the fusion is the important character. The change in position of certain swaras also is cause for difference between North and South Indian regional music of India which will be discussed later. In Instruments and dance also these two major differences do occur.

Soothra 9:-*KeralaKarnaataandhradramidaadideseshu prathithamekam .Lakshmanapuravangagurjaraadhiaparam.*

The music of Kerala, Karnataka, Andhra and Dramida etc (by the word Dramidaadi –Dravida etc Thulu also is included) are belonging to South Indian music. Music of Lakshmanapura, Vanga, Gurjara (Gurjaraadi means Gujarat etc which includes Sindhudesa also) are North Indian. Now we generally call it as Karnatic music and Hindusthaani music. Purandaradasa of Karnatakadesa made modifications which were accepted by all South Indian musicians. Since Purandaradasa was from Karnatakadesa, at present all south Indian music is called Karnatik music. Similarly , because of the old name of Sindhusthaana for India , the term Hindusthaani originated from the Persian language which have no pronounced S syllable.(Sindhu, Hindu , Indu – Sindhia, Hindhia, India is the derivation of our country's name).

Soothra 10:-*Thathra maargadakshinayorathra praadhaanyena prasthaava:*

The root cause for all is the Margasangheetha .Even if it is of different varieties, it has more resemblance to the south Indian music. How the South Indian music differs from Margi music ? To understand that one has to know general character of Margi music.

Soothra :- 11 *Ranjakam swaramelanam geetham*

Geetha is that music which uses the different swara so that hearts are attracted (due to the pleasure created). If a swara which is not suitable for a raga is used , or if used without differentiating the amsaswara of different raga, (so that everything look alike) if more than three swara are used with the same measure of ucha and neecha (high, low) it will not give this quality and thus it cannot be called a Geetha. That is specifically shown by using the term Ranjakam.

Rathnaakara says : *Ranjakam swarasandarbho geethamityabhidheeyathe.*

Soothra 12 :-*Ranjakasthaayantharanganaadavishesha:swaraa:*

Swara are the special Naada which are inside a sthaayi , and are parts of it and are Ranjaka (pleasing). Sthaayi was defined earlier . If 120 vibrations to 240 vibrations is taken as a sthaayi , the swara which are pleasing within this range are called swara. These swara are the main parts of that particular sthaayi . By adjectives like Ranjaka and Nadavishesha, one has to understand that all the naada within a sthaayi are not taken as swara. They have to be pleasing in nature. Swathoranjayathi srothruichitham sa swara uchyathe . That which by its own nature pleases the listener's heart is swara. Within one sthaayi , this ranjaka nature will not happen to more than seven swara at one time. These seven can in different times change .

Thebhya kaamschidupaadaaya geeyanthe sapthageethishu aadriyanthe cha ye theshu swarathwamupalabdhathe , says Sage Dathila. The cause for such swaranaada are the vibratory numbers .

Soothra 13:-*Swaraantharanganaadaa :sruthaya:*

Those naada between the swara, and are parts of those swara are called Sruthi. That is Naada between the 7 swara in a sthaayi are sruthi. By common parlance people speak of sruthi as the the last sruthi of the Madhyasthaayishadja . But it is only a general usage like a “man comes” in which the term man denotes a general name only.

Between two nearby swara, 10 vibratory numbers should create 10 naadavishesha . Tha means there are 10 sruthi between two swara . Since the doubling of the vibratory number is cause for sthaayi difference , sruthi between the 2 swara of second sthaayi should be double than the first sthaayi. Thus when the sthaayi become louder , the swarantharanga sruthi also doubles. Such doubts can arise in those unaware of music. To remove them , even if by differing the vibratory number subtle nada differences do happen , all such naada are not sruthi . Since the sensory strength of human beings is limited , that also is included to designate the name of sruthi.

Soothra 14:-*Yena susikshithaanaam*

yathkinchiduchaneechathaantharaavagamasthaschruthimaanam

All the sthaayi are orderly and become more and more ascending order in loudness by the series of Naada vibrations. Those who have experience and training in the low and high nature of these sruthi series , grasp the smallest difference in low and high and that difference in vibratory number is designated as a sruthi . Sruthi thus is the smallest difference of vibratory number cognizable by a trained experienced person. (not by a layman). In his commentary to Bharathasaasthra , Abhinavaguptha says: *Sruthirnaamasabdasya vailakshanyamaathrakaari yadroopaantharam* .The term Vailakshanyakaari designates that which gives cognizance of difference alone (not all the series of naada are cognized even by a trained ear). By the difference in sthaayi each swara and the vibratory number between swara are doubled but the number of sruthi does not double because of this. The reason for this is further explained .

Soothra 15 :-*Ethena mandramadhyathareshu kramena*

dwigunaparikampasamkhyayaiva naadochaneechabhaavagraha ithi na madhyaadou sruthyaadikyamityapi sidham

From what is said so far it is clear that in the three sthaayi called mandra, Madhya and thaara the vibratory number of naada doubles in order , and because of that by difference in sthaayi the number of sruthi will not increase. To cognize the naada in mandrasthaayi the minimum difference is 4 vibrations, and for madhyasthaayi it is 8 and in tharasthayi it is 16. When vibratory speed increases the parts of sound waves become more subtler and this is the cause for such difference. Therefore in Madhya and thaara there will not be more sruthi than the mandra. By sthaayi difference the number of swara also does not increase because of this reason.

In the sound series of a sthaayi the 7 amsa naada are useful at a time and they are the swara . The amsanaada between these swara are the sruthi. According to a specific raga, at one time certain amsanaada become swara and in this way all amsanaada can become swara . Then why cant be the swara also called sruthi ? To clear this doubt the next soothra begins.

Soothra 16 :- *Swaranaadaa:sthaayayaarambanaadaascha :*

The amsanaada which become swara are also sruthi. That is why the words of Viswavasugrantha are important. It says : *Sravanendriyagrahyathwaadhwanireva sruthirmatha: Saa chaikaa dwividhaa gneyaa swaraantharavibhaagathaa:niyathasruthisamsthaanaal geeyanthe saptha geethishu thasmaal swaragathaa gneyaa sruthaya:sruthivedibhi:antharasruthivarthinyo hi antharasruthayo mathaa:thaasaamapi swarathwam cha kriyaagraamavibhaagatha:*

The beginning of a sthaai Shadjaswara also is called Sruthi. Reason being, depending upon it is the order of the following swara and sruthi. The usage Sa chaikaa in Viswavasugrantha, also points out this aadhaarasruthi. *Ekaiva sruthi: prathisruthyaadibhinna:prathibhaasa :* says Sage Mathanga about this Aadhaarasruthi. *Srooyathe vailakshanyenethi sruthi* . The place of sruthi in Geetha is now pointed out .

Soothram 17:- *Thaa geethasya moolam varnaa iva vaakyasya*

Just as Varna is the root for all sentences in literature (sahitya) sruthi is the root cause for all geetha in music (sangheetha). .In literature a sentence is made of words, words are made of varna or letters . In music geetha is made of swara and swara are made of sruthi . How many sruthi are detectable by a trained ear in one sthaayi ?

Soothram 18:-*Sruthirekaiva sopaanasaraninyaayena*

vaathodhadhoomapatalanyaayena vaa vyavasthithotharotharabhangyaa srooyatha ityeke.

Sruthi is only one. Two comparisons are given here. 1 In the form of a ladder . 2.In the form of the smoke going up when winds blow continuously . These two comparisons for sruthi are given in sthaayi . For shadja 4 sruthi, for rishabha 3 sruthi etc thus show the positional change of the same sruthi itself. But the author says this is illogical in next soothra.

Soothra 19:-*Thannayuktham.Drishtaanthayorapi vyakthibhedasya*

sphutathwaath.Swaraanaam mitho

naadabhedasyaanubhooyamaanasyaapalaapaprasangaath

.Parikampasamkhyabhedha naadabhedasyaanishedhyathwaath

This opinion is not logical . Because the similies cited (ladder and smoke rising) itself there is difference between the individuals. The first step in a ladder is not the same individual as the second. The first layer of smoke is not the second layer .Second reason is that each swara like the shadja etc is audible as different Naada which is experienced by all. If all were the same sruthi this difference will not be there. And no class difference between Naada occur in such a case. Thirdly , the vibratory number that cause shadja swara and rishabha swara are not the same. Since the effect (swara) are different the cause also is different . Therefore , the opinion shown in soothra 18 is considered illogical.

Ekaiva sruthi:chathusruthyaadibhedabhinna:prathibhaasathe – says

Mathanga.Dwanireva sruthirbhaveth saa chaikaapidwidhaa gneyaa

swaraantharavibhaagatha says Acharya Viswaavasu. How , if sruthi are different and not one, the words of Mathanga etc can be explained ?

Soothra 20:- *Mathangaadibhisthu*

sthaayyaadhaaraprathamadruthermadramadhyathareshu

nimithakrithavyakthibhedepyekajaatheeyathaam

sthaayimadhyagathasruthiswaraanaam thaamaadhaarasruthimekaamanusmritya
vyavasthithim cha darsayithum thaschrutheraivaikathwamuktham.

Mathangamuni says sruthi is one. But he did not say that there is only one sruthi . The one sruthi he mentions is about the adhaarasruthi for sthaayi as shadja.

Because of this following the general law , all sruthi which are effect (karya) of that one cause (kaarana) in a sthaayi are ekajaathi (belong to same class/ group) and are sajaatheeya . This adhaarasruthi determines and reveals all other sruthi forms as its revelations (*chathusruthyaadi bhedabhinna prathibhaasathe*). All sruthi are differentiated based on that sruthi which is the adharasruthi of that sthaayi .

According to Viswavasu (saa chaikaapi) by the dharma of dwani all sruthi are one, all sruthi are dwani only, yet it has two divisions called swarasruthi and antharasruthi .The swaragathasruthi of Viswavasu are the sudhaswarasruthi . Antharasruthi are Vikrithaswarasruthi .

Another opinion is now shown .

Soothra 21:-*Uthaalasalilatharangaparamparaavadasamkhyeyathwaadananthaam sruthaya ityanye*

According to others just like the series waves in an ocean the number of sruthi are also endless and cannot be calculated or determined. Kohala says this :

Aananthyam hi srutheenaam cha soochayanthi vipaschitha: yathaa

dwani viseshaanaam mamaanam gaganodare

.Uthaalapavanodwellajjalaraasisamudbhavaaka iyatya :prathipadyanthe na tharangaparamparaa:

In each wave are numerous water particles (jalaparamanu or subatomic particles of water) .Similarly in each wave of sound are numerous subatomic sound particles and all of them are included in sruthi . The author does not think that this is correct .See next soothra.

Soothram 22 :-*Thadapi na yuktham. Ukthalakshanaanurodhena*

sravanaayogyaanaam naadatharangasookshmaavayavaroopamaathrakaanaam

sruthithwaabhaavaadekadwiparikampabhedakrithabhedaanaam

vailakshanyagrahaaprayojakathwaannimeshamaanena

sahasrapanchakaadhikasamkhyaaajanyaanaamasraavyathwena

sthaayinyekasminnanthatha:panchasathotharadwisahasraparikampakrithabheda anaameva sambhavana cha thaasaam samkhyeyathwaacha

This is illogical, says author.Sruthi being the audible naada parts of sthaayi in geetha , the inaudible subtle subatomic parts cannot come under the definition of sruthi.If we take this view , then even anaahatha naada has to be called a sruthi . If there are more than 5000 vibrations in nimesha (1/8th of second) that naada is inaudible. Therefore it is not sruthi. In one sthaayi the audible sruthi cannot exceed 2500. Thus it cant be Anantham or endless. In a geetha , among the audibles, the middle five sthaayi only are coming.

For sruthi , instead of the naada part of a sthaayi, we take the dwani difference. Then sahaja, doshaja, abhighaathaja are the three types of sruthi, or according to dosha classification they can be vaathaja, pithaja, kaphaja, sannipaathaja and samsargaja (5 types). This division is not about the musical sruthi which we are discussing here . In music from a flute, the comparative strength for dhvani is sometimes spoken of as sruthi. Venamuni says in this sense :

Dwisruthithrisruthischaiva chathusruthika eva cha swaraprayoga :karthavyo vansachidragatho budhai:

These classifications of sruthi also are not what we are speaking about here. When the opening in a flute is closed by a finger , by the vibration of that finger one can produce 2 sruthi; if half of the hole is opened one gets 3 sruthi and if fully opened 4 sruthi is the meaning . It just shows the comparison of the strength of naada in different usages.

Dwikthrikachathushkaasthugneyaa vansagathaa : swaraa:

Kampamaanaardhamukthaascha vyakthamukthaasthathaiva cha

Ithi thaavanmayaa prokthaassameechya :sruthayo nava: (Bharathamuni)

Now we will come to the classification of Sruthi according to teachers like Bharathamuni .

Soothra 23 :- *Thathra maargaswaraanurodhena dwaavimsathi :sruthaya ithi SriBharathaadyaacharya:*

Ancient scientists of Musicology like sage Bharatha etc , on the basis of the order and law used in Margi music have said that within a sthaayi 22 sruthi are present.

Bharathamuni says : *Evaanena sruthidarsanavidhaanena*

dwaigraamikyodwaavimsathisruthaya:pratyavaganthavyaa: That means in the Shadjagrama and in Madhyamagrama there are 22 sruthi .

Soothram 24:-*Veenaadwaye thalpareeshtirapi*

Author says the word Darsithaa has to be added to this soothra, showing again the authorship of the soothra to be different from the commentator. The test for 22 sruthi in one sthaayi is to demonstrate in two veena . Bharathamuni has said about this demonstration : *dwe veene*

thulyapramaanathathryupapaadanadandamoorchane shadjagraamaasrithe kaarye .

Two veena which are of same size, and in which the strings are tied according to maargaprasthaana in the same manner so that the arohana and avarohana swara are produced , are equalized on the same shadja as adharasruthi .The swara will be in the same place in the two veena.If the string of one veena is loosened so that its shadjagraamapanchamam is equalized with the panchama of madhyamasthaayi (thrisruthipanchama) . The veena with loosened string is Chalaveena. In it , by this procedure one sruthi is lessened .The panchama of shadjagrama is one sruthi less than the panchama of madhyamagrama.This is the measure of one sruthi. Loosen the string of chalaveena again so that its gandhara is one with the rishabha of sthiraveena, and with Nishada its dhaivatha. Between rishabha and gandhaara , and between dhaivatha and nishaadha two sruthi difference each is present.Again loosen string of chalaveena and its rishabha brought to the adharasruthi shadja of the sthiraveena ,and with panchama its dhaivatha.The difference between shadja and rishabha and between panchama and dhaivatha is 3 sruthi each.Again loosen

string of chalaveena and its panchama brought to the madhyama of Dhruvaveena (sthiraveena) and with gandhara its madhyama, with nishada its thaarasthaayishadja. Difference between madhyama and panchama, between gandhara and madhyama, between nishada and shadja is 4 each . In this way we get measure of the 4 sruthis.

4 each for madhyama, rishabha, panchama =12

3 each for rishabha, dhaivatha =6

2 each for gandhara nishada =4

The total sruthi in a sthaayi =22

This is how the 22 sruthi are demonstrated using a fixed and a moving (sthira/dhruva and chala) veena. Bharatha and other ancient teachers have clearly explained this test for number of 22 sruthi . Nissangasarngadeva has mentioned another way. He says in 2 veena which are of equal size, tie 22 strings each. The first string is kept in the most mandra state . The second slightly higher , yet in such a way that no other naada is heard between the naada of the first and second string . In this order keep all the 22 strings . The naada produced by each of the string is called the 22 sruthi. Then decide the swara for the two veena. Shadja has 4 sruthi. That means the swara coming in 4th string is shadja. The naada in 7th string is rishabha. 9th is gandhara. 13th is madhyama. 17th is panchama. 20th is dhaivatha. 22nd is nishada. This is fixing of the swara in strings . Next loosen the string of one of the veena and make its naada , nearer and nearer to the next one. Those swara will be one sruthi less than that in the sthiraveena. Then loosen again and make it nearer to the next string. Then it will be 2 sruthi less than sthiraveena. The string of rishabha in sthiraveena and string of gandhara in chalaveena ; dhaivatha string of sthiraveena and nishada string of chalaveena will be equal sounds. Again loosen string and make it equal to third string in sthiraveena. Then it will be 3 sruthi less. The shadja and panchama strings of sthiraveena and rishabha and dhaivatha of chalaveena will be equalized also. Again loosen and make it equal to 4th string. It will be 4 sruthi less than fixed veena. The nishada, madhyama and gandhara of sthiraveena will be equal to the shadja, madhyama and panchama strings then. Loosen the shadjaswara of chalaveena further , there will be no string below to which its naada can be equalized. By this experiment it can be proven that there are 4 each for shadja, madhyama , panchama, 3 each for rishabha and dhaivatha, and 2 each for gandhara and nishada and only a total of 22 sruthi are in a sthaayi.

The experiment and demonstration by Bharathamuni is simpler and easy . That of Sarngadeva is more complex , and difficult to perform but proves without any doubt that what Bharatha said is absolutely true . According to Sarngadeva's experiment from Nishaada to another Nishaada is one sthaayi and the first naada of the sthaayi is nishaada. Since this does not correspond to the teachings of older teachers and is not an accepted and famous theory , Sarngadeva's 22 string experiment remains a proof for Bharatha said, and not applied in day to day practice. The famous theory is that shadja is the first naada and from shadja to shadja is one sthaayi . Bharatha has said that all moorchana, thaana , alamkaara should start from madhyasthaayishadja and all swara begin with shadja and depend upon the first shadja used. The statement that shadja has 4 sruthi means

the difference between shadja and nishaada is 4 sruthi. Kaakali swara which is 2 sruthi less than shadja is considered as a variety of nishada .Antharaswara which is 2 sruthi less than madhyama is considered as a variety of gandhara . (not as shadja or madhyama).Bharatha says: thathra dwisruthi prakarshaannishaadavaan kaakaleesamgno nishaada: na thu shadja :Therefore , the earlier naada of a said swara , the naada of sruthi upto the earlier naadas of a later swara are the varieties of that swara as vikrithaswara according to this opinion.The naada one sruthi less than shadja is called chyuthashadja ; one sruthi less than madhyama as chyuthamadhyama;one less than panchama is chyuthapanchama;2 sruthi less are considered as nishada and gandhara.

Therefore in the experimental veena, the method of sarngadeva fixing shadja in 4th string so that sthayi starts in sudhanishada is not practiced . The method of dividing a sthaayi as 22 sruthi is based on Margi music and its swara positions and sudha and vikritha swara. Abhinavaguptha etc explaining vailakshanyagraahakanaadaanthara says it is not possible to divide the naada in a sthaayi with any number more than 22 and to determine sruthi number like that . Bharatha etc does not speak of such things and does not go into such mathematical and theoretical discussions but is more practical about the musical part of it . Sarngadeva says that the strings of sruthi should be conjoined so that between the two strings no other naada should be heard and naada should merge like that. At the same time only the trained can cognize the naada which are very subtle and others cannot .If the trained ears cannot differentiate the difference between two strings ,a s Sarngadeva wants to be done, then the shadja will not come in 4th, and rishabha will not come in 7th and so on and for this several strings have to be passed which will exceed 22 and just with 22 strings the series of Naada will not be completed. Since this is known even to a child, Bharatha etc are not contradicting Abhinavaguptha's opinion but is being practical about musicological experiments and creativity .This is more logical , says the author. The experiment with 2 veena (by Bharatha and Sarngadeva) is for proving that 22 sruthi in one sthaayi in the method of Margi music is scientific and practical. In the regional music of South India , because of the position of swara, the number of sruthi in a sthaayi also can change.

The principle of sruthi is this: In nimesha , hundreds of vibrations produce hundreds of Naada waves and from it , to know the difference of one from the other for a trained ear (scholarly ear) there are certain rules. If there are 104 vibrations and sound waves. In a series of 100/nimesha vibrations, the 100th wave and the 104th wave are sruthi. 101, 102 and 103 will not be sruthi. Because they are not cognized as different by even a trained ear. They are the incognisable differences between sruthi only .

Now the laws of the sruthi (as 22 sruthi pattern per sthaayi) according to opinion of Bharatha is explained.

Soothra 25:-Thathra shadjasya

graamamoorchanaadyaarambhakathwaathamapekshyaanyaswaraanaam

vyavasthithessampradaayasidhathwaacha thatha aarabhya

kramaadrishabhaadesthriddwihathusthriddwistruthaya:swareshwathi bhagavaan

bharatha :

Bharatha says the order should start based on the last sruthi of shadja and first sruthi of rishabha .

Grama, moorchana, Thaana and Alamkaara all begin based on this sruthi at the end of madhyasthaayi shadja. The order of seven swara begin with shadja.(sarigamapadhani).Shadja, 3 rishabha, 2 gandhara,4 madhyama, 4 panchama, 3 dhaivatha, 2 nishada, for the next shadja beginning (aarambhashadja) 4 – these are the order of sruthi of pure swara in a sthaayi according to Bharathamuni.

Thisro dwe: cha chathusracha chathasthrisra eva cha

Dwe chathasrascha cha shadjaakhye graame sruthinidarsanam

Thus from shadja to shadja is one sthaayi ,Sthaayi end at last sruthi of last shadja And begin at last sruthi of first shadja (or first sruthi of rishabha) .Terms like mandrashadja, madhyashadja,taarashadja means the beginning of a mandrasthaayi etc, not as a shadja included in the mandrasthaayi .We speak of a limit of forest also as a forest . Thus the shadjaantya sruthi at beginning and end of a sthaayi are included in a sthaayi itself. Thus uniting these 2 shadja sarigamapadhanisa is the sthaayi swara order. Another opinion is mentioned in next soothra.

Soothra 26:-*Kechithu nishaadaanthyasruthimaarambhaavadhim krithwaa shadjanishaadaantharasruthishwaadyasrutheraarabhya sthaayini dwaavimsathisruthikramamaahu:*

According to Sarngadeva the last sruthi of Nishaada is the beginning of the sthaayi , and begin with the first sruthi between shadja and nishaada and include 22 sruthi in a sthaayi. The 4 sruthi for the shadja, then 3 sruthi for rishabha, is their order . *Thisra : sruthirathikramya deya:shadjachathusruthi:* is their opinion. In his opinion also the law that the vibrations per nimesha and sound waves double causing the difference in sthaayi and it holds good for all swara .The difference is only in making the last sruthi of nishada as the beginning of a sthaayi. The different jaathi (class) given by ancients to the 22 sruthi is now spoken of .

Soothra : 27:*Thaaschopacharithagunaanugunyaena deepthaayathaa mridwee madhyaa karunethi panchajaatheeyaa*

The 22 sruthi according to their special quality are grouped into 5 classes Deeptha, aayatha, Mridhwi,Madhya , karuna etc. Madhura is a rasa or taste which tongue gets when eating sugar.Like that the blissful taste enjoyed by the organ of hearing also is called madhura .

Soothra 28:- *Thathra*

sthaayyaarambhashadjasruthi: rishabhaadyasrutheraarabhya

shashtanavamaikonavimsasruthayascha deeptaayaamantharbhavathi .

Chathurthaashtamathrayodasasapthadasasapthadasathamaasthwaayathaayaam.

Dwitheeyaikaadasapanchadasavimsathithamaamridwyaam.Thritheeyaa dasamee

dwaadasee shodasyashtaadasyekavimsathithamaa cha madhyaayaam prathama panchama sapthamachathurdasyascha karunaayaam

In those sruthi series, the beginning of the sthaayi (shadja) , among the sruthi between shadja and rishabha 1, 6,9,19 sruthi (4 numbers) are the deeptha jaathi . 4, 8, 13, 17 (4 numbers) are aayatha jaathi.2,11,15,20 (4 numbers) are Mridwi jaathi. 3,10,12,16,18,21 (6 numbers) are Madhya jaathi.1,5,7,14 (4 numbers) are karuna jaathi.Nissangasarngadeva names 22 sruthi staring from the last sruthi of

Nishaada. They are theevra,
kumudwathi, mandra, chandovathi, dayavathi, ranjani, rathika, roudri, krodha, vajrika,
prasaarini, preethi, maarjani, kshithi,
raktha, sandeepini, aalaapini, madanthi, rohini, ramya, ugra, kshobhini.

Rathnaakara says :-

Theevraakumudwatheemandaachandovatyasthushadjagaa:

Dayaavattheeranjane cha rakthikaacharshabhesthithaa:

Roudreekrodhaa cha gandhaare vajrikaatha prasaarinee

Preethischa maarjaneetyethaa: sruthayo madhyamasthithaa:

Kshitheerakthaa cha sandeepinyaalapinyapi panchame

Madantheerohineeramyetyethaasthrisrasthu daivathe

Ugraa cha kshobineethidwenishaadevasatha: sruthee

Others name them as

sidha, prabhavathi, kaantha, suprabha, sikha, deepthimathi, ugra, hradini, nirviri, dira, sarvasaha, kshaanthi, vibhoothi, maalini, Chapala, baala, sarvarathna, saantha, vikalini, unmeelini, visaarini, prasoon. (sangeethamakaram). Like swara sruthi also has samvaada , anuvaada and vivaada due to the special form of the Naada. For it th similarities and differences are causes.

Sruthijaathimandala of Margi music

Sruthi	Jaathi Deeptha	Swara Sa
1	Karuna	
2	Mridu	
3	Madhya	Ri
4	Aayatha	
5	Karuna	Ga
6	Deeptha	Ga
7	Karuna	
8	Aayatha	
9	Deeptha	Ma
10	Madhya	
11	Mridhu	
12	Madhya	
13	Aayatha	Pa
14	Karuna	
15	Mridu	
16	Madhya	Dha
17	Aayatha	
18	Madhya	Ni
19	Deeptha	Ni
20	Mridhu	
21	Madhya	
22	Deeptha	Sa

(Ga and Ni are between 5 and 6 ; and 18, 19 respectively .I have therefore written it in both columns.)

Soothram 29:- *Ethenantharasrutheenaamapi thathatswarahethuthwam
kaischidukthamanaadeyam vyavasthithathathwaschrutheenaam
thadvyakthithwenaiva swarahethuthwaath*

For each swara the antharasruthi before them also are causes .The shadjaswara which is 4th from a nishadaswara the 3 swara before it are causes. Shadja is the 4th sruthi after nishada. To be the 4th , there should be 3 sruthi before it . Therefore the 4th is due to the 3 sruthi on which it is dependent .

*Nanu sruthi schathurthyaaadirasthwevam swarakaaranam
Thryaadeenam thathra poorvaasaam srutheenaam hethuthaa katham
Brumasthuryaa thritheeyaadi:sruthi:poorvaabhikaamkshayaa
Nirdhaaryethetha:sruthaya:poorvaa apyathra hethava (Sarngadeva).*

The author does not approve this. The 4th sruthi after Nishada is shadja , not as a 4th sruthi. It is in its own form. The individuality within it makes it a swara. The shadjathwa makes it a shadja , not the 4th position . Someone may ask , then why is this law applied to other swara too. The author says the doubt is foolish just like asking why is not Maithran not so handsome as Chaithran. The beauty is in the individuality and originality of that swara . Ahobila says in all the 3 sruthi before shadja are the shadja individuality .That means those 3 sruthi are also individually shadja itself.

*Sruthirvinaikayaa srutyaa yadi shadja : prajaayathe
Thadaa thayaanyathaa sidhaa :sruthayasthaa bhavanthi hi
Evamevaanyathaasidhirsarvathra sruthishu sthithaa
Swaraaschediha jaayerannekasrutyaa prithak swayam
Satyam shadjaschathurdhaa syaal mriduthwaadivisesathaa:
Thathajjaathivisishtathwaannaaanyathaasidhiranyatha:
Avachedakabhedena kaaryathaayaa:prithakthwatha:
Thrinaaranimaninyaayaath kaaranathwam bhavediha (Ahobila)*

There is no causal role for the previous three swara for shadja .

Shadja swara is of 4 types. Mridushadja, madhyashadja, aayathashadja, and deepthashadja .

The 4 sruthi of shadja become the cause for each of these.Fire can be formed by union of grass and winds,churning ofwood called arani,and union of sunray with suryakaantha stone. But each is the cause for a special type of fire. With one type of union only that fire is formed. Says Ahobila.Chathusruthishadja means between nishada and shadja are 3 sruthi.If Devadatha is between chaithra and maithra, it does not mean that devadatha is the cause for either of them.

Bharatha said thureeyasruthou shadjam.Mathanga said thisra:srtheerathikramya deyashadjam

The second sruthi after nishaada is a type of nishada called kaakali, and is not shadja.

Soothra 30:-*Thaascha sruthayo hridayagathadwaamvimsathinaadijanyaa ithi
kechidanumanyanthe.Thadapyanaadeyam.Kandathaalwaadaavapi
thathaapathe.veenaayaamanyathaivopapathe.maargaswarasthithyanurodhenaiva
dwaavimsathidhaa vibhaagaaddheseeyeshu sruthisamkhyaadhikyasya sidhathwaacha*

The 22 sruthi are within the heart. There is a major Naadi which is turning upwards from the heart and there are 22 branches for it . When praanavaayu (oxygen) flow/strike each of them a different sruthi is produced. This is how vocal music is produced. The bigger upward naadi is the swaasanaadi (the vessel that carry breath) and the 22 smaller ones are horizontal to this vertical Naadi . Each of them are in the heart and when oxygen enters each of them in order ,the Naada will become more and more high pitched .Rathnaakaram says :

Hridyurdhwanaadisamlagnaa naadyo dwaavimsathirmmatha:

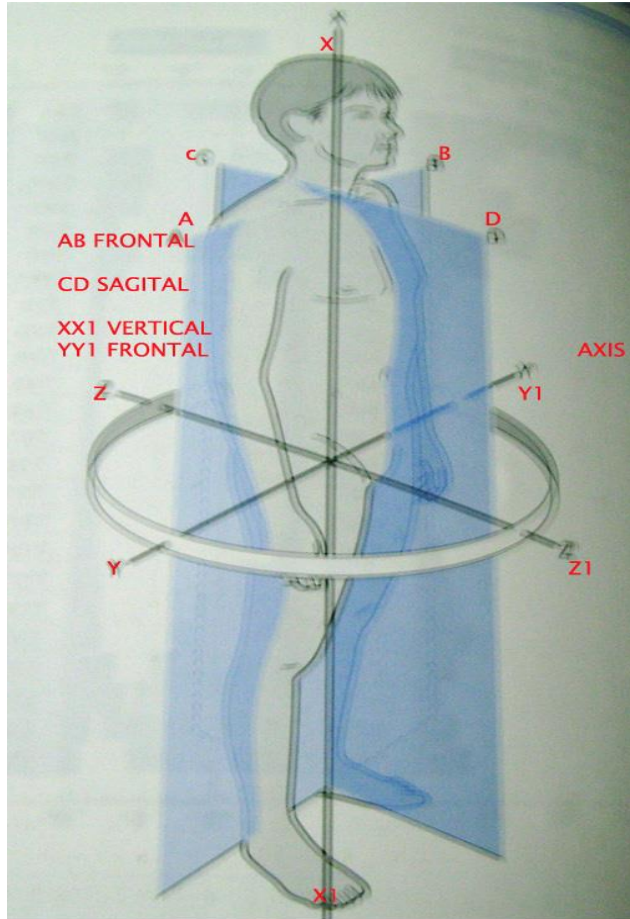
Thiraschyasthaasya thaavathya :sruthayo maaruthaahatha:

Uchochatharathaayukthaa:prabhavanthyutharotharam

Raagavibhodha says :- *Hridhyurdhwanaadikaasthwaavimsatyrnathi raajanaadishu Thaava ntha:sruthisamgnaa:syurnnaadaa:paraparochoachaa*

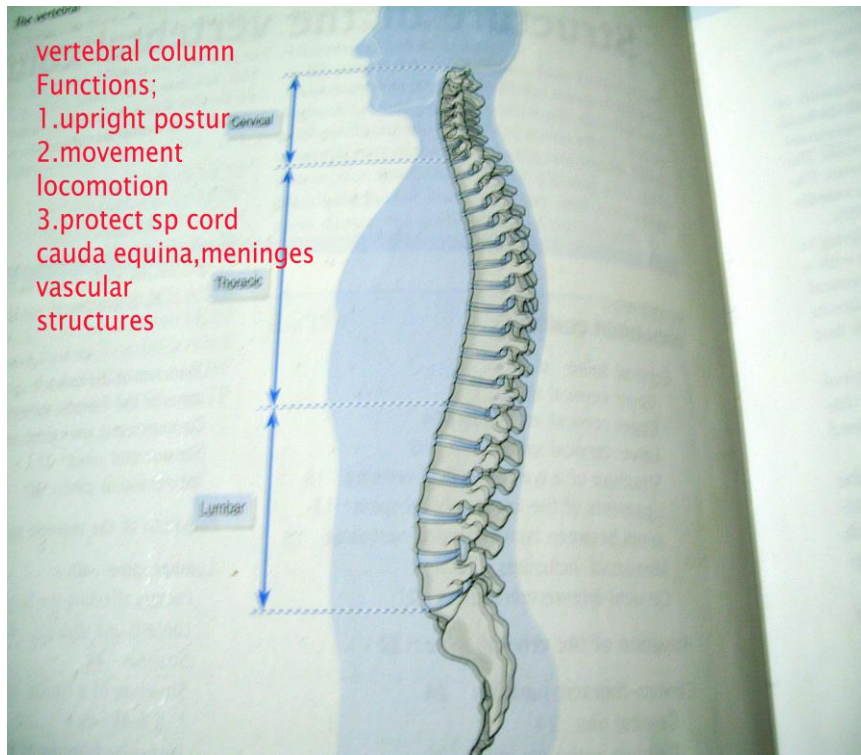
This guess work is not accepted by author. He says , if so, according to difference of sthaayi, there should be 22 each in neck, palate , head etc also. The authors mentioned above actually think so as evidenced from the quote : Evam kanta yathaa seershe sruthidwaavimsathirmmathaa(Rathnaakaram) and Urdhwasthithathrinaadishu naadyo dwaavimsathi :sthithaa (Paarijaatham). In veena as the strings are fixed more and more number of vibrations and hence Naada enhances is experienced by experiments. Thus, due to the difference in effort of the Praanavaayu (oxygen) the sabdavaahini naadi become more powerful and naada enhances must be correct.

(The author has mistakenly understood the word hridaya for the heart .Yogic parlance has Kundalinihridaya – kundalini as the heart – and if we look at the clinical anatomy we can see the real relationship.

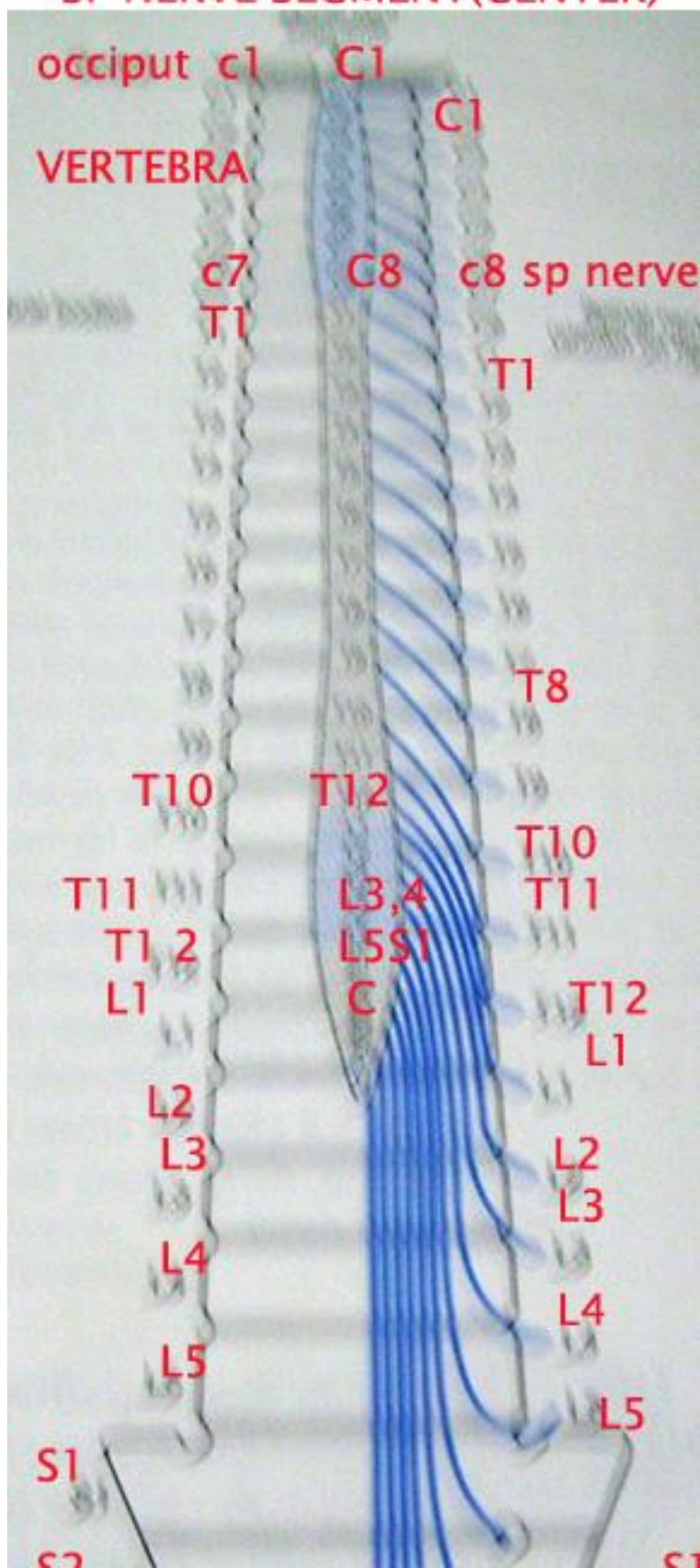


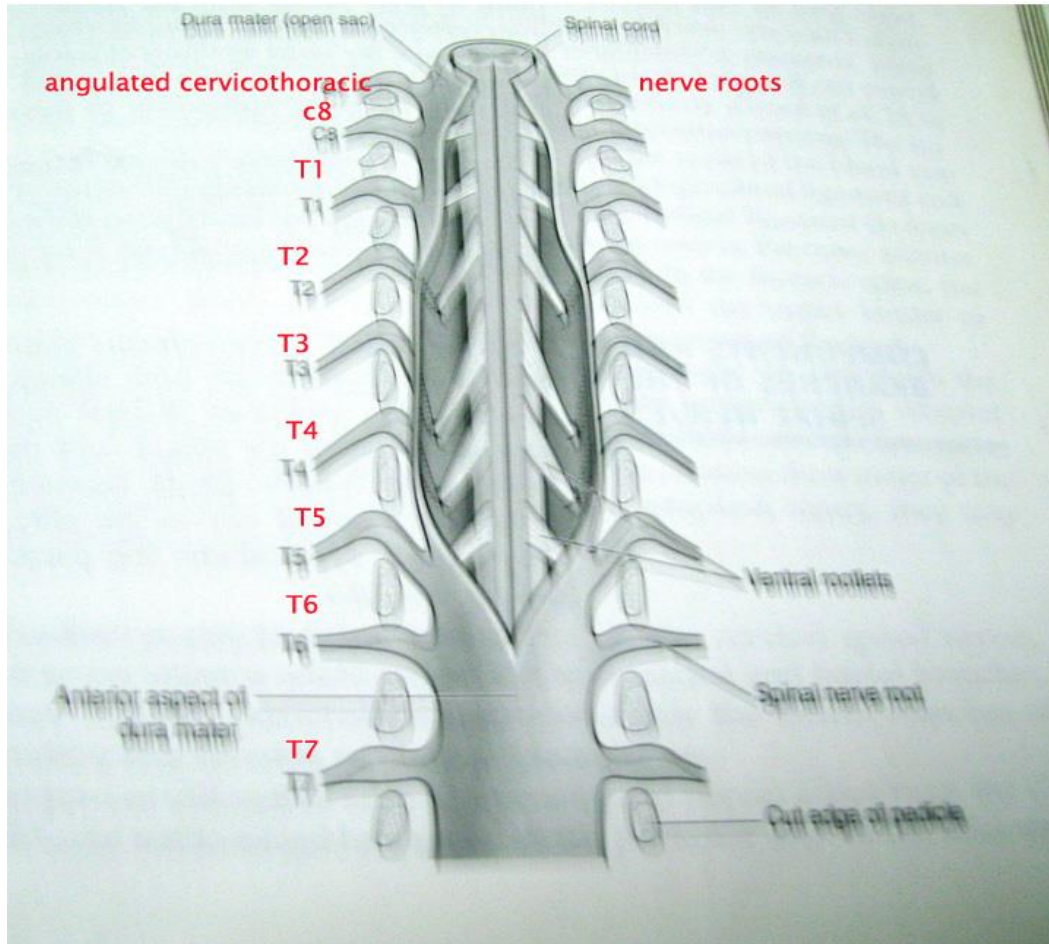
PLANES OF BODY AND AXES OF MOVEMENT. CIRCLE IS HORIZONTAL PLANE. AB & CD ARE PLANES
XX1, YY1, ZZ1 ARE AXIS.

The sareeraveena (Gaathraveena) within the spinal cord and vertebral column
.Count the number of gaps between the vertebra .The nerves cross through these .



SP NERVE RELATION WITH
VERTEBRAL BODY(LEFT)
SP NERVE SEGMENT(CENTER)





Spinal cord as sushumna and its nadis at right angles (see horizontal and vertical relations).

This clinical division is neither a guesswork nor imagination but the knowledge derived from millions of years of medical practice (as there is evidence from Susruthasamhitha etc) yogic literature , and from the analytic and practical philosophy of the land. Translating words like Hridaya to the English equivalent Heart as we know it according to the modern medical science had made the confusion for the authors, including Krishnapisharody, author of Sangeethachandrika).

According to Acharya Hanuman there are more than 24 sruthi. *Yeshaam sruthiswaragraamajaatyaadirnyatho na hi*

naanaadesaagathasthaayaadeseeraagaasthu the mathaa: This means whichever Raaga does not correspond to the systematized Margi sruthi, swara, grama, the Raagamoola Jaathi etc are the Desi raga. This has no reference to the 22 Nadi in human body at all. But is only about the musical changes made by different regions from Margi system . If even at the time of Hanuman , a relatively very ancient human being (probably an earlier race than Homosapiens) this was known in India , the antiquity can be understood as well as the antiquity of music , medicine and human existence in the South East Asian continents. The 24 divisions of Gayathri, of Veena

are from the 24 divisions of nervous segments on human body and the 2 omitted (before shadja) make it 22 sruthi in one sthaayi is the explanation I give to this . And the production of Naada and music in a human body pertains to these 22 sthaana .Since the rest of the commentary of this soothra of Krishnapisharody does not find out this relationship , it just goes on contradicting the said view and I just omit that part here.

Soothra 31 :- *Samapavarjyamanyeshaam dakshine sthaanabhedaath , vilakshananaadaroopaantharaasrayanaacha thathra sruthisamkhyadikyam*
Shadja, panchama and Madhyama are more or less fixed in their position but the other 4 have positional change in music of the south India. In maarga, rishabha is in the third sruthi after shadja. There is no artificial (vikritha) rishabha in that. In 4th sruthi it is vikritha or artificial rishabha. In marga, the 5th from shadja and 7th are gandhara. In dakshina, 6th and 8th are gandhara. After panchama, the position of nishada and dhaivatha also are different in marga and dakshina music. Therefore the sruthisamkhyaa (number of sruthi) is more in South (dakshina) than in Marga .The change in form of Naada which is cognizable only with its difference in lakshana (mentioned above) and sruthi change functions as pleasing notes in South Indian music (dakshina) which is not there in Margi music. Gouda, Saveri, Thodi, Malavagouda etc have a sudharishabha , but they are not in the same sruthi. If used in the same sruthi, they will not give the pleasing individuality of each of the raga. Similarly , antharagandhara and vikrithadhaivatha of Kalyani and Kamboji become ranjaka (pleasing) by their sruthi difference. Thus , since the dakshina accept the systematized sruthilakshana of margi, and make it pleasing by changing the sruthi position in each raga , in one sthaayi , it appears there are more than 22 sruthi . And this factor is pointed out by Hanuman (as quoted above) showing that music evolved in South India , probably during the time of Neanderthal and their ancestors .

Soothra 32 :-*Samapasamkhyaanurodhena srutheenaam samaanamaanakathwasayukthathayaa sagayo:panyoschaantharaa prithaksruthishadkasathwaacha :*

The scientific and logical way accepted in Dakshina music is to accept the same measure for shadja, madhyama and panchama as in Margi music (4 sruthi each) and then consider all sruthi with same measure ,and in such case between shadja and gandhara (5 sruthi for margi) become 6 sruthi for dakshina. After panchama 3 for dhaivatha , 2 for nishada also we get 6 (instead of 5) then. Thus in a sthaayi the shadja , madhyama and panchama are equal with 4 each , and 6 each between shadja and gandhara and panchama and nishada a total of 24 is obtained. This 24 is also present in Margi , in Gayathri chandas of Veda and hence the difference cited from Margi is nonexistent. Of this 2 are omitted and Bharatha says Dwaavimsathi sruthaya : (22 sruthi) taking the two ends of the spectrum of Naada as inaudible .

Soothra 33:-*Samaanamaanakathwapareekshaa chithraveenaayaam yathaa dwe thanthryou madhyasthaaayyaarambhashadjasthithe samanasruthike kaarye: Thathasthanthreethritheeyaamse thaarapanchamam swayam prakaasayathi sthaane thanthree chathurthaamse thaaratharashadjam swayamprakaasayathi sthaane chakramaal saarikaadwayam sthaapayel. Punasthayormmadhye thanthreesapthamaamse*

thaaratharakaisikam sookshmathayaa prakaasayathi sthaane cha saarikaam
 sthaapayel. Evam krithe panchakasaarikaayaam madhyasthaayipanchama
 :shadjasaarikaayaam madhyasthaayimadhyama:kaisikasaarikaayaam
 madhyasthaayiprathimadhyamascha bhavanthi. Itham samaanamaana
 sruthidwayaabhyaam madhyamapanchamayorantharaa
 sruthichathushtayalaabha:Atha thanthreepanchamaamse
 thaaratharaantharagaandhaaram swayamprakaasayathi sthaane saarikaanyaasena
 thathra madhyasthaayigathaantharagaandhaaro bhavathi. Punasthanthreemekaam
 kinchidapakrishyaaparaayaam prathimadhyasthaane yathaasyaam panchamo
 bhavathi thathaa krithwaa ethachalathanthri
 gathaantharagaandhaarasamaananaadonysyaam yathra bhavathi thathraapi
 saarikaam nyasyel. Evam krithe thasyaam sthirathanthryaam sudhagandharalaabha
 :thathaa gandharamadhyamayorantharaa samaanamaanasruthidwayaabhyaam
 sruthichathushtayalaabhascha.Punarapi chalathanthreemapakrishya thasyaam
 panchamam sthirathanthreem madhyamam chaikanaadam kuryaal. Thadaasyaam
 madhyama :sthiraayaam gandharaschaikanaado
 bhavatha:athaasyaamantharagaandhaarasamanaado gaandhaarasamanaadascha
 sthiraayaam yathra yathra bhavathasthathraapi saarika nidatyaa. Evam
 samaanamaana dwaadasasruthilaabha:sthiraayaam
 sudhavikrutharshalobhascha.Evam krithe chalaayaam
 prathimadhyama:sthiraayaamantharagaandhaaraschaikanaado bhavatha
 ityantharagandharamadhyamayo:prathimadhyamapanchamayoscha
 sruthidwayaantharasya sidhathwena shadjasudharshabhayorapi thathsidhirithi
 shadjaadaapanchamam
 thulyapramaanachathurdasasruthilaabha:panchamaadaashadjam
 sruthidasakamanayaiva reetyaa drashtavyam.

The experiment with Chithraveena in Dakshina (south India) to demonstrate that all
 sruthi are of equal measure is given.Two veena are arranged so that two strings in
 them are at the beginning shadja of the madhyasthaayi. From Meru to Kukubha , the
 length of that string is divided into 3 , and the part near the Meru with
 thaarasthaayipanchama as swayambhoo, and also in that part of string (when divided
 into 4 equal parts) near to Tharasthaayipanchama as swayambhoo keep a Mettu each .
 In the middle of these two places , and where the string is divided into 7 equal parts
 as the second part from Meru and where thaaratharakaisika appear as subtle sound
 keep a mettu. If we play with touching these mettu , at the tharapanchama
 swayambhoo position we hear madhyasthayipanchama , in tharatharashadja
 swayambu position we hear madhyasthayimadhyama, and in tharatharakaisika
 swayambu position madhyasthayi prathimadhyama . Thus in equal measures, from
 madhyama to prathimadhyama and from it to panchama, two sruthi each we have 4
 sruthi from madhyama to panchama. In position , (when string is divided into
 5)where it is near to Meru and where antharagandhara of Taaharasthayi is
 swayambhu keep a mettu. If veena is played touching that part we get
 antharagandhara of madhyasthayi. After that loosen one string and the panchama in it
 is made equalized to pathimadhyama of the other string .In that chalathanthri the
 naada of antharagandhara is listened to and determine from which position in the
 sthirathanthri same naada comes. At that place keep a mettu.Thus 4 equal sruthi

between gandhara and madhyama (2 from sudhagandhara to antharagandhara and 2 from it to Madhyama) are obtained. In total we have now 8 equal sruthi. Loosen the chalathanthri further , and its panchama made equal to madhyama of sthirathanthri. The antharagandhara and gandhara of it listened to and ascertain from which place in sthirathanthri these naada emerge. Keep a mettu in these and we get vikrutharshaba and sudharishabha . Thus from the sudharishabha to vikritharishabha 2 , and from it to sudhagandhara 2 are obtained making 12 equal sruthi. In this position prathimadhyama of chalathanthri will be antharagandhara of sthirathanthri. The difference between antharagandhara, madhyama ; and between prathimadhyama and panchama are 2 . Thus if sudharishabha f one should equal the antharagandhara of the other , the shadja of first and sudhaganhara of second should be equal. That makes the difference between shadja and sudharishabha naturally 2. Thus from shadja to panchama there should be 14 equal sruthi. From panchama to next shadja there should be 10 equal sruthi from same experiment. How ? Keep the two strings at the beginning of shadja of madhyasthaayi. Keep a mettu at position where tharashadja is swaprakaasa in middle of string. Keep mettu at the following positions :

In 7 divisions third from Meru with subtler tharatharakaisika;
In 5 divisions 2nd from Meru with thaaratharaanharagandhara as swayambhu;
We get the beginning shadja of thaarasthaayi at thaarashadja position mettu and nishada of madhtasthayi at kaisika position (sudhanishada in form of kaisikinishada) and in mettu at antharagandhara we get vikrithadhaivatha of madhyasthaayi .
Loosen chalathanthri again , and its panchama equaled to prathimadhyama of sthirathanthri. Where he thaarashadja of chalathanthri becomes in middle of nishada and shadja of sthirathanthri keep a mettu. We get kaakalinishada of madhyasthaayi. In this way , vikrithadhaivatha - where it comes in middle of panchama and vikrithadhaivatha of sthirathanthri – keep a mettu. We get sudhadhaivatha of madhyasthaayi. Thus from panchama 2 equal sruthi each, in the 5 swara of sudhadhaivatha, vikruthadhaivatha, sudhanishada, kakalinishada, tharashadja we get 10 sruthi . In one sthaayi through equal 12 swara positions total of 24 sruthi are possible in Southern Classical music as demonstrated by this experiment (which is the 24 numbers of letters in Gayathri of Margi). A simpler method to discover the equality of measure of sruthi is now said.

Soothra 34:- *Yadwaa darsithareetyaa panchamaadanharagaandhaaraanthyam
chathusrassaarikaasthathalswayambhoonaadasthaaneshu samsthaapya
thantheemekaamapakrishya
thalpanchamamitharathanthreegathaantharagaandhaarasamanaadam kuryal
thathaschalathanthreegathaaprathimadhyamaantharagaandhaaranaadaasthirathant
hryaam yathra yathra bhavanthi thathasthaaneshu thisrassaarika nidaatheetha.
Evam samaanamaanaa dwaadasa sruthayassidhyanthi. Thadaa
thachalathanthreegathasudhagandharanaada:sthirathanthreeshadjanaadascha
samasyaadithi shadjarbhayoscha dwisrutyantharithathwam sidham. Evam
shadjaadaa panchamam samapramaanachathurdasasruthilaabha :*

As said before mettu for panchama, madhyama, prathimadhyama , antharagandhara are fixed at positions of swayambhoo naada , and then a string is loosened so that its panchama is equal to antharagandhara of the other. Then the prathimadhyama , madhyama and antharagandhara of that string listened to and its equal nada positions

in the sthirathanthri are fixed with 3 mettu. Thus we get 12 sruthi each 2 sruthi less than the other in order from panchama to sudharishabha. The gandhara of chalathanthri will be equal to the beginning of shadja of sthaayi. The gandhara and antharagandhara have 2 sruthi difference, and shadja and rishabha also has 2 sruthi difference. Thus from shadja to panchama equal measured 14 sruthi are present. From panchama to tharashadja the 10 equal sruthi also can be thus experimentally proven. To prove that there are 10 equal sruthi between panchama and shadja another experiment is shown.

Soothra : 35:- *Thathaschalathanthreem punarapyapakrishya mandrapanchamam nayel. Thadaasthiraayaam madhyammarthanyasthasaarikaa chalaayaam madhyashadjaaarikaa bhavatheethi shadjamadhyamayordasasrutyantharithasya sidhathwaalsidham panchamashadjayorapidadasrutyantharithathwam.*

From shadjam to panchama are 14 sruthi. Then chalathanthri is loosened again, and based on the sthirathanthri nada of madhyasthaayi shadja, keep it as mandrasthaayi panchama swara. As kept in sthirathanthri for madhyamaswara, in chalathanthri madhyasthaayishadja will be heard. In sthirathanthri like madhyamaswara, in chalathanthri madhyasthaayi shadja will be heard. Between shadja and madhyama are 10 sruthi and between panchama and shadja also there are 10 sruthi.

Soothra 36:- *Thaascha poorvokthapanchajaatheeyaa. Thathra prathamapanchamadwaadasapanchaadasaikonavimsathithamaa. Pancha mridyu:dwitheeyaashtamashodasadwaavimsathithamaaschathasra:karunaa:thritheey ashashtathrayodasasapthadasavimsathrayovimsathithamaa:Shanmadhyaa:chathurth anavamaikaadasachathurdhasaashtaadasaa:panchaayathaa:sapthamadasamaikavim sachathurvimsathithamaaschathasro deepthaschethi.*

Those 24 sruthi are in the 5 Jaathi previously stated as Deeptha,

Mridu, karuna, Madhya and aayatha. From the beginning shadja of the sthaayi they are

:1,5,12,15,19 are Mridujaathi

2,8,16,22 are karunajaathi

3,6,13,17,20,23 are madhyajaathi

4,9,11,14,18 are aayathajaathi

7,10,21,24 are deepthajaathi

Dakshinasruthijaathimandala :-

Sruthi	Jaathi	Swara (approximate position) Sa
1	Mridu	
2	Karuna	Ri
3	Madhya	
4	Aayatha	vi.ri
5	Mridu	
6	Madhya	Ga
7	Deeptha	
8	Karuna	An.ga
9	Aayatha	
10	Deeptha	Mad

11	Aayatha	
12	Mridu	Pr .mad
13	Madhyama	
14	Aayatha	Pa
15	Mridu	
16	Karuna	Dha .
17	Madhya	
18	Aayatha	vi.dha
19	Mridu	
20	Madhya	Ni.
21	Deeptha	
22	Karuna	Ka.ni
23	Madhya	
24	Deeptha	Sa

The author says this sruthiswara position given by some authors is not correct , in next soothra.

Soothra 37:-*Yathwamaatyavenkatamakhiprabrithibhirdakshinepi dwaavimsathisruthibraantya sruthiswarasthithirbahudhaa vyaakuleekrithaa thadasangatham. Lakshyalakshanavirudhathwaath.*

The author of Swaramelakalanidhi Raamaamaatya, author of Chathurdandiprakaasika Venkatamakhi etc misunderstood that since Bharatha has said there are 22 sruthi in Marga it is the same in Dakshina system. Abhinavaguptha has given lakshana of sruthi as “ sruthirnaama sabdasya vailakshanyamaathrakari yadroopaantharam”. Mathangamuni has said : srooyantha ithi sruthaya. This means sruthi are those which are heard or cognized separately from each other. The definition being this, what Ramamaya and Venkatamakhi said is against the lakshana of sruthi .The dialectics of lakshya and lakshana are demonstrated by citing their sruthi and swara positions.

Soothra 38:- *Thathaa hi thanmathe sthaayinyekasmin dwaadasa swaraa: samapavarjyam keshaanjinnaadaabedhapi poorvotharasamgnaamaathravasaadutharasamgnaakalpanayaa krithashodasasamgnaa.*

According to their opinion in south Indian method in one sthaayi there are 12 swara positions. Though there are 12 swara based on difference in Naada , including sudha and vikritha swara those except shadja,madhyama and panchama some have two names each without considering the difference in Naada based on the earlier swara and the later swara. Thus 16 names are given for 12 swara. Sudhagandhara itself in some raagawith sudharishabha (which is preceding sudhagandhara) is called gandhara and when there is no sudharishabha before or with sadharanagandhara or antharagandhara come after is called panchasruthirishabha . The same nada as sadharanagandhara if there is sudharishabha or panchasruthirishabha before it , is

called gandhara and in others without rishabha and with antharagandhara after is called shadsruthirishabha . Similarly sudhanishada if there is sudhadaivatha before and no nishada after is called nishada and if no sudhadhaivatha before but either kakali or kaisiki after it, is called panchasruthidhaivatha .Similarly the same naada called kaisikinishada if no dhaivatha before and no kakalinishada after is called nishada. If no dhaivatha before and with kakalinishada after it is called shadsruthidhaivatha. Thus among the 12 , four naada has different names according to such absence of presence of swara before and after it , there 16 swara positions in one sthaayi .

Soothra 39:-*Thalprapanchaswaraprakaase*

Like that giving different names to the same naada is not necessary. That will be explained in the chapter Swaraprakaasa.

Soothra 40:- Thathaa cha thathra madhyashdjsthaapithasaarineethanthryaam chithraveenaayaam thanmathe saheeyam sruthisaarikaasthithi. Thritheeyaayaam sruthou sudharishabasya saarikaa. Panchamyam sudhagandharapanchasruthikarshabayo:shashtyaam sadharanagandharashadsruthirishabhayo:ashtamyamaantharagandharasya : Navamyam sudhamadhyamasya, dwaadasyaam prathimadhyamasya thrayodasyaam panchamasya. Shodasyaam sudhadhaivathasya .Ashtaadasyaamsudhanishadapanchasruthidhaivathayo:ekonavimsyaa kaisikanishadashadsruthidhaivathayo:ekavimsyaam kaakalyaa:dwaavimsathamaayam thaarashadjasya chethi

In their opinion in shadja which is at the end of the beginning shadja of madhyasthayi, in chithraveena with fixed saarini string, the position of mettu and sruthi is as follows:

From 3rd to aadharashadja the mettu for sudharishabha;

In 5th sruthi for sudhagandhara and panchasruthirishabha;

In 6th sadharanagandhara and shadsruthirishabha;

In 8th antharagandhara;

In 9th sudhamadhyama;

In 12th prathimadhyama;

In 13th panchama;

In 16th sudhadhaivatha;

In 18th sudhanishada and panchasruthidhaivatha;

In 19th kaisikinishada and shadsruthidhaivatha;

In 21st kakalinishada;

In 22nd Thaarashadja.

For thaarasthaayi also in this order is sruthi position. Venkatamakhi says *swareshu sudhavikrithabhedaadyaam dwaadasaathmasu thathaahi sudharishabe sruthayathisra eerithaa :*

Sruthiswaramandala of Amatya etc :-

Swara	Sruthi number	Swara
Sa	1	
	2	
Sudharishabha	3	

Sudhagandhara	4	Panchasruthi Ri
Sa.gandhara	5	shadsruthiRi
antharaGandhara	6	
Sudhamadhyama	7	
	8	
Prathimadhyama	9	
Panchama	10	
	11	
Sudhadhaivatha	12	
	13	
	14	
	15	
	16	
Sudhanishada	17	Panchasruthidhaivatha
Kaisikinishada	18	Shadsruthidhaivatha
	19	
Kakalinishada	20	
	21	
Sa	22	

Soothram 41:- *Athra sphuto lakshyavirodha:dakshinaprasidhaGoudathodee saaveree malaharyaadi raage rishabadhaivathayo:thrisruthikathwe thathadraagaranjakathaavisheshahaanerveenaayaam sphutathwaal Kalyaanyaadishu panchasruthirishabhaadiprayogebhi thathaa*

In the said sruthi order above, between shadja and sudharishabha and between panchama and sudhadhaivatha the difference in sruthi is 3 each. The famous pleasing Raga of south India like Thodi,Saveri,Malahari, Gouda etc which have sudharishabha and sudhadhaivatha , if we use rishabha or dhaivatha in 3rd sruthi the raga loses the pleasing nature due to that particular amsa. It even produce apaswara. This can be demonstrated by veena. In Gouda there is no dhaivatha but in the other 3 it do exist. Sudharishabha is important in Gouda. Similarly in Raga like kalyani if rishabha and dhaivatha become panchasruthika the pleasing nature is lost and it creates apaswara. Between gandharamadhyama and between madhyamapanchama and between nishadashadja there are 4 sruthi each according to sruthi measure. To the panchasruthirishabha of these authors which is sudhagandhara , from shadja and to panchasruthidhaivatha which is sudhanishada from panchama difference is 6 sruthi each. These swara does not come in kalyani or sankarabharana. Therefore , chathusruthirishabha , chathusruthidhaivatha which are 2 sruthi less than the abovesaid is to be used in these raga as decided by Govindacharya. They too consider chathusruthirishabha chathusruthidhaivatha as sudhagandhara and sudhanishada respectively and from positions of panchasruthirishabha and panchasruthidhaivatha of Venkatamakhi they take as sadharanagandhara, kaisikinishada, shadsruthirishabha and shadsruthidhaivatha and say sudhagandhara and sadharanagandhara are bhinnaswara , sudhanishada and kaisikinishada are bhinnaswara . But there is no

particular need for such naming . These can very well be two names given for the same same naada/swara. This will be clear in chapter on Swaraprakaasa. Sadharanagandhara and kaisikinishada of venkatamakhi are not the 6th sruthi from shadja and panchama but in the 7th sruthi. In raga like Harapriya that prayoga will not be correct. Like this the lakshana and lakshya are quite contrary to each other .

Soothra 42:- *Thathaa vyavasthithaayaam chithraveenaayaam sudharishabhasaariikaasthaane rajjwaa dridam badhwaa tham swaramaadhaarasaruthimaryaadayaa shadjee kuryaal. Thadaa poorvavyavasthithapanchamasthaane thanthreechathurthaamsadyothakathaaratharashadjaamkitha:sudhamadhyama:poorvaprathimasthaane thanthreepanchaamsadyothakathaaratharaantharagandhaaraamkitho madhyasthaayantharagandhaaraschaayaathi.Evam cha poorvam shadjaanavamasruthou sthithasya sudhamadhyamasyethaaneem dasamasruthisthithirashatamyam sthithasyaantharagandharasya navamasruthisthithischethi sphuto lakshanavirodha:*

Thus in chithraveena with fixed mettu as said before with a thread at sudharishabha saarika position that is taken as shadja nada based on which the geetha is sung. In the position which was panchama before, that which divide the vibratory series of the string as 4, and where tharatharashadja is swayambhoo will now become madhyamaswara. Similarly that which was prathimadhyama , one sruthi less than panchama, where the vibratory series is divided into 5, and thaaratharaantharagandhara is swayambhoo naada becomes antharagandhara .Thus that which was 9th sruthi as madhyamaswara, become 10th from shadja .That which was antharagandhara and 8th from shadja become 9th sruthi. Therefore when the beginning naada of sthaayi changes number for sruthi for each swara also changes. The author Krishnapisharady thinks that this change makes their form incorrect (whereas it is the most correct and scientific way , since vibratory number decide the form of naada). The measure of all sruthi is not the same. Some are small in measure and others bigger. Thus sruthi number changes . The experiment in Chithraveena is thus correct. The sruthi of rishabha and dhaivatha are a little bigger . To answer this the next soothra begins.

Soothra 43:- *Sruthinaamasamaanamaanakalpanamasaasthreeyam sruthikalpanathadvibhaagayogayoreva moolachedaapathe*

The measure of all sruthi is not alike and since the 3 sruthi of sudharishabha are bigger when we change its position to shadja , the number of sruthi increase for madhyama and antharagandhara is not a logical explanation. To consider difference in the measure of sruthi there is no proof. That will even harm the statement that the base for dividing the sthaayi are the cognition of different sruthi. The sruthi for determining the position of swara should be of equal measurement.Only then the positioning of swara will be correct. If not so there is no need to fix the number of sruthi in one sthaayi and divide it accordingly In Margi method , since rishabha and dhaivatha are not artificial and the position of these are between 3-4 sruthi from shadja and panchama in equal measures Bharatha has determined it as 3 sruthi difference in a general way. In South Indian method now followed , the rishabha and dhaivatha exist both as sudha and as vikritha (natural and artificial). Therefore their

position has to be fixed based on correct measurement of sruthi. Only then we can practically make use of it in music.

Soothra 44:- *Kaakalyantharaprathimaanaam*

swotharaikasruthimaathraantharithathwasya praacheenasidhaanthavirodhaascha
Add Thadasamgatham to this soothra , says the author. For kakalinishada , from shadja and for antharagandhara from madhyama , and for prathimadhyama from panchama one sruthi difference is shown which is against the saying of Bharatamuni and ancient teachers. They call a swara with one sruthi less as a variant of the swara only. Not as a variant of the earlier swara. Therefore swara which is one sruthi less than shadja and used extensively in marga is called chyuthashadja. Swara one sruthi less to panchama is chyuthapanchama (which is not there in Dakshina)swara one sruthi less than madhyama is chyuthamadhyama .Antharagandhara has 2 sruthi less than madhyama and kakalinishada has 2 sruthi less than shadja according to ancient teachers. Thathradwisruthiprakarshaannishaadavaan kaakaleesamgno gandharo na madhyama : (Bharatha). That is swara with 2 sruthi more than sudhanishada has become nishada with the name kaakali. It is not a variant of shadja. Gandhara with 2 sruthi more than sudhagandhara is antharagandhara and not a variant of madhyama. There is no swara called prathimadhyama in Margi music. But its position is there just as in Dakshina . It is between madhyama and panchama (with 4 sruthi in between) 2 sruthi more than sudhamadhyama 2 sruthi less than panchama and in subtle kaisikinada as swayambhu.(It is not position as one sruthi less from panchama.) Only then the swara coming between nishada and shadja (with 4 sruthi between) gandhara and madhyama (4 sruthi between) will be the variants of the earlier nishada and gandhara, and one sruthi less swara will be variants of later swara shadja and madhyama as stated by ancients. Only then that swara can be called a prathimadhyama or as Venkatamakhi calls it Varalimadhyama .The correct positions of antharagandhara,prathimadhyama,kakalinishada are 2 sruthi more than the pure or sudha forms, and 2 sruthi less than the later swara and hence the middle(Madhya). In some raga for sake of pleasing nature by gamaka use certain high or low bhaava is made . This is true for all swara and their positions.

Soothra 45:-*Veenaavivaranaswokthivirodhaacha.*

The sruthi and swara determination of Ramamatya and Venkatamakhi is explained by them in their Veenaprakarana. In Veenaprakarana the nature of sudhamela is 4 swarathanthri as anumandrashadja, anumandrapanchama,mandrashadja,mandramadhyama. (Ramamatya).In the first string in 3rd sruthi sudharishabha,in 5th sudhagandhara,in 6th sadharangandhara,in 8th chyuthamadhyamagandhara(antharagandhara),in 9th sudhamadhyama,in 12th chyuthapanchama(prathimadhyama) –like this 6 mettu are fixed in the position of swara. If so, in the remaining 3 strings in the middle 4th string as in the second sudhapanchama will come. According to them from shadja to sudhagandhara there are 5 sruthi ,from madhyama to panchama 4 sruthi .Then , fixed in the same position in shadja string sudhagandhara and in madhyama string panchama will not come as they say.

According to Venkatamakhi , in sudhamelaveena the method of Ramamatya is wrong .His order is as follows: First string in mandrashadja,second in mandrapanchama,third in madhyashadja and 4th in madhyasthayimadhyama. In the first mandrashadja string,

as Amatya has shown he too fixes 6 mettu for sudharishabha etc. In second mandrapanchama string the 6 mettu are in order sudhadaivatha,sudhanishada,kaisikanishada,kakalinishada, madhyashadja, sudharishabha. In 3rd string as the first string order madhyasthaayi sudharishabha to varalimadhyama (prathimadhyama) comes. In 4th madhyasthayi madhyama string, prathimadhyama,panchama,sudhadaivatha,sudhanishada,kaisikinishada and kakalinishada . In first string in 5th sruthi for sudhagandhara mettu, the panchama which is 4th sruthi of madhyama in 4th string, in 6th sruthi sadharanagandhara mettu the sudhadaivatha which is 7th from madhyama , in first string 8th sruthi antharagandhara mettu the 9th from madhyama as sudhanishada are shown. Instead of 5 four,instead of 6 seven,is added and how can this be correct for the form of the art , asks the commentator. This will not fit in with laws of sruthi,he maintains. The rise or fall of one sruthi is to be ignored and it will not be a blemish , he says. Somanatha has said srutyaikayaadhikathwam nyoonathwam vaa na doshaaya. But author says it was an error committed by somanatha and the others are also repeating the error. Saying that one sruthi less or more is to be ignored if we change it in geetha and raga which has fixed swarasthana there will be apaswara blemish .Therefore the statements given by these authors does not fit in with their own principles of music.

Soothram 46:- *Sarvamidam vyaakuleekaranam bahutharabramamoolakam*

.Dakshinepi

dwaavimsathisruthibrama:sudharishabhaadermaargeeyasthaanabrama:samapramaa nanaadachathushtayasyaavyavahithathwe

vaichitryaprayuktharanjanasyaasathwaadvibhinnanaadaathmakadwadadaswareshu vibhinnaanaam saphthanaadaanaameva raagakaarithwamithi yathaayatham

sapthaswaramathrasya raageshu grahanamithi sthithou

naadabhedavalsamgnaabhedasyaapi

ragaviseshaniyamakathwabrama:samgnaadwaye swarabramadwaya ityaadi .

All these confusions happened to these authors because of their errors. The first illusion was that just as in Margi , in Dakshina also there is only 22 sruthi in one sthayi. Then started to fit in that into swara. They had illusion that in Dakshina also there are 3 sruthi for sudharishabha and sudhadaivatha as in Margi. Naturally the illusion came that the vikritha rishabha and daivatha of south Indian music is the gandhara and nishada positions. There are 12 swara with different nada in a sthaayi. But no raga exist with more than 7 swara.The reason is that equally placed different naada when they are too close without interval, become undifferentiated and therefore without pleasing nature. Therefore such a usage will not become a raga either. To make a raga , minimum of 3 different nada with equal distance is needed. But its pleasing nature will be less. Sapthaswara principle for pleasing raga music is that shadja,panchama, any of the 3 different nada from the 6 nada before panchama, any of the 2 different nada from the 4 nada after panchama only can make different raga forms. Thus 7 different Nada with different names like rishabha , gandhara etc for each swara position is what is maximum possible for making a raga (sampoornaraga with 7 swara). It is not the name but the naada which makes raga . These authors had an illusion that it is the name which makes music and not the naada. They thought the seven names and seven naada are same.

In the famous Raga called saranga sudhamadhyama and prathimadhyama come together. But as in other raga (gandhara considered as rishabha) sudhamadhyama is not considered as gandhara and 1 swara as 17 . The name difference is only in rishabhagandhara and dhaivathanishada . Thus there are only 16 swara positions.

One cannot say that this was done without the knowledge of raga Saaranga. In

ragavivaranaprakarana it is said :- *Saayamgeyasthu*

*saaramga:sudhamadhyamagaanuitha: and also sudhamadhyamagandharam
krithwaa geyodinaatyaye (Venkatamakhi).*

Antharagandhara and sadharanagandhara are actually the same swara. Bharatha has specifically said this. *Saadhaaranavidhimidaaneem vakshyaama:thathra*

*saadhaaranam naamaantharaswarathaa kasmaal dwayoranthareyortho bhavathi sa
sadharana :yathaa rithwanthare chaayaasu bhavathe seetham praswedo bhavathi*

*cha thapasthasya.Na cha naagatho vasantho na cha nisseshassirakaala:ityathra
kaalasaadhaaranathaa.Athra dwe saadhaarane .Swarasadharanam*

jaathisadharanam chethi .Swarasadharanam kakalyantharaswarou .Thathra

dwisuthiprakarshaannishaadavaan kaakaleesamgno nishaada:na shadja:

*Dwaabhyaamantharaswarathwaalsaadhaaranathwam prathipadyathe. Evam
gandharopyantharaswarasamgno gandhara: na madhyama:*

thayorantharaswarathwaal. Atha eva

:swarasadharana:kasmaaannishaada:kaakaleesamgna:kalathwaal

kaakalee.Kashtathwaa dwaa. Athisoukshmyaadwaa.Athavaa

kaakaakshivadubhayasambandhaath kaakaleesamgna:evam nishaaada:

kaakaleesamgno gandhaaraschaantharasamgno bhavathi .(Bharathamuni)

Sadharana means the middle swara.That which is in themiddle of two objects is called the common or saadhaarana. For example , time between two seasons . When one

season has gone and the other has not arrived . That is kaalasaadhaarana. In music there are two types of sadharana. One is swarasadharana and the other is

jaathisadharana. Swarasadharana are kakalinishada and antharagandhara.Being 2

sruthi more than sudhanishada kaakali is a variant of Nishada.Not a variant of shadja.

(to be a variant of shadja 3 sruthi should increase) It is between nishada and shadja

and hence is sadharana. It can be either called a kakalinishada or a sadharananishada.

Similarly antharaswara as gandhara is variant of gandhara and not of madhyama. It is

between gandhara and madhyama. Why is a sadharana nishada called kaakali nishada

? Kalam is a unmanifested sweet naada. Because of this nature it is called kaakali. It

is a Naada with depth (gahananaada), or a very subtle Naada, and just like the eye of a kaaka (crow) has relation to either side .Like this the name is given.

Sudhanishada is called kaisikinishada and they are not different swara. It is the subtle naada heard in veena as a kesa (thin hair) in position of its swayambhoo. This subtle

sound is also heard at the prathimadhyama position as swayambhoo and hence

prathimadhyama also has the name kaisikinishada.There are only 2 gandhara (sudha

and sadharana called antharagandhara) and nishada (kaisiki or sudha and kaakali or

sadharana) and division of them into 3 each (as sudha, sadharana and anthara /

sudha,kaisiki,kaakali) is nothing but illusion .

That with one sruthi more than sudhagandhara is sadharanagandhara. That with one

sruthi less of panchama is varalimadhyama . The authors who describe like this, when

they come to veena with mettu fixed accordingly , say that one sruthi less or more can

be ignored. Then , sudhagandhara , sadharanagandhara and madhyamantharagandhara, panchamaprathimadhyama , shadjakaakalinishada according to their opinion becomes same swara with one sruthi more or less (which can be ignored). Thus , the laws made by these authors is a wonderful magic of confusions created out of errors .

Soothra :- 47: *Thasmaadukthavidhayaa dakshine sudhavikrithabhedena dwiprakaaraa rigamadhanayassapouchethi naadabhedamavalambyaiva dwaadasaswaraa :prathiswaram samaanamaane dwe dwe sruthi ithi chathurvimsathi :sruthaya:yathaayatham vibhinnanadam swarasapthakamaasritya raagaviseshaaschetyanenaiva saamanjasye vyartham krithrimashodasaswarakalpanaadikamityavadheyam*

Therefore ,as shown before, in south Indian method in order two types (sudha and vikrith) of rishabha,gandhara,madhyama,dhaivatha and nishada makes 10 swara and shadja and panchama each makes total of 12 positions of swara. For each swara equal 2 sruthi make it 24 sruthi. In the 12 swara, the swara should be used such that the pleasing nature is not lost. In this way any of the 7 swara together makes innumerable raga .This being the simplest method , without difference in naada, dividing them to 16 swara is unnecessary. Like this , 24 sruthi, and equal sruthi for each swara is the accepted norm.

Soothra 48:-*Evam sathi veenaayaam sudharshabhasaarikaamaarabhya sudhamadhyamasaarikaantham kramasorajwaa dridam badhwaa thathalswarasya shadjeekaranentharagaandhaaradhiswayambhoonaadasthaanaani kramaadutharotharasthaaneshu samkramishyantheethi sphutaa sruthiswaraanam samaanamaanathaa .*

In this method the equality is clear in the veena. The position at sudharishaba is tied with thread and made adhaarashadja , the positions of swayambhoo naada of antharagandhara, panchama antharagandhara is heard at the middle of madhyama before it, madhyama at prathimadhyama position, panchama at sudhadhaivatha position. If the thread is at Vikritharishabha position, the swara considered as shadja, the swayambo naada ascends antharagandhara at prathimadhyama position,madhyama at panchama position , panchama at vikrithadhaivatha. Similarly make each of the swara as shadja , the swayambhoo naada also ascend by one swarasthaana in order. Thus when it is tied at madhyama position, and madhyama is made shadja, panchamaswayambhoo naada is at the thaarashadja position of the earlier . This is the proof for the equality of all swara in measurement . Therefore the sruthi which are within the swara also should be equal .

Dakshinasruthiswaramandala:-

Number of sruthi	Swara Sa
1	
2	Sudharishabha
3	
4	Vikritharishabha=chathusruthirishabha
5	
6	Sudhagandhara
7	

8	Vikrithagandhara=sadharanaga=antharagan
9	
10	Sudhamadhyama
11	
12	Vikrithamadhyama=prathimadhyama
13	
14	Panchama
15	
16	Sudhadhaivatha
17	
18	Vikrithadhaivatha=chathusruthidhaivatha
19	
20	Sudhanishada=kaisikinishada
21	
22	Vikrithanishada=kaakalini=sadharananishada
23	
24	Sa

Soothra 49:- *Atha eva vikrithayo*

*:rishabhaadhaivathayo:shadjapanchamaavyavahithotharathaayaam
chathusruthikathwavyavahaarassamgachathe*

Only if it is so, the rishabha near the shadja if it is vikritha can be called chathusruthirishabha. So too dhaivatha near panchama if vikritha becomes chathusruthidhaivatha. Vikritharishabha and vikrithadhaivatha are, if as Ramamatya say in 5th sruthi from shadja and panchama, this naming of scholars will not be correct. If these names (like chathusruthirishabha) are just translator names for designation, such contradiction does not happen. For experience, the 24 sruthi theory is more suitable.

Soothra 50:- *Evameva cha veenaayaam*

*shadjathanthreenavamabhaagasthaparikampasringalaasandhaangathena
chathusruthikarshabhena panchamasya
,panchamabhaagasthasandhaanagathenaantharagandhaarena
thalsandhaanaantharasthasya chathusruthi dhaivathasya cha
samvaadonubhooyamaanopi samgachathe*

In south Indian music, some swara have special communication(samvada) by experience. Panchama is samvadi for vikritharshabha. The 5th swara (panchama) position in veena is at the joint (sandhaana) where its vibratory series of string fork as three. That third again fork into 3 and at that 9th joint is chathusruthirishabha position. Therefore when panchama is made shadja, the vikritharishabha is the panchama of that shadja.(panchama). The third string in veena is made in mandrasthaayipanchama and make it shadja, its panchama in 4th string fixed in madhyasthayishadja will be at vikritharishabha position. Thus swara which come in same vibratory series develop samvadi nature between them. Antharagandhara and chathusruthidhaivatah have samvada since they are at joint where the vibratory series fork as 5 parts. Generally between shadja and panchama there is samvada due to this natural position in joint. Such swarasamvada which are experienced in Dakshinadesa music are logical when

the sruthiswaravyavastha (law of sruthi and swara) is as above shown as a mandala. In Venkatamakhi and others such manifested joints of vibratory series are lacking for rishabha, dhaivatha etc and their samvada to panchama and antharagandhara (which is experienced logically) is lacking.

Soothra 51:-*Ethena margadakshinayosthaalamaathraamaana iva sruthimaane samapavarjam swaraanaam sthaanamaanepi vailakshanyam vyaakhyaatham*

By saying this, Margi and Dakshina has differences in the measurement of Thaala (rhythm) , in sruthi of sthaayi, and position of swara except that of shadja, madhyama and panchama is clear. In Marga , the time needed to pronounce 5 short swara is one maathra or unit of measure of time. (kaalaparimaana). *Nimeshaa:panchamaathraa syaal* (Bharatha). *Panchalaghuaksharochoaramithaa maathreha kathyathe* (Rathnaakaram).

In Dakshina method, one maathra is time to pronounce 4 short letters. Thus the maathra or unit of time for thaalam/rhythm is different in both.

In margi there are 22 sruthi in one sthaayi and in dakshina there are 24 sruthi in one sthaayi.

The position of swara except shadja, panchama and madhyama also differs .Thus swara position , sruthi number also are different just as the unit of time for rhythm. In marga from shadja to antharagandhara , and from panchama to kakalinishada the sruthi are divided as 7 each. In dakshina it is divided as 8 each.

Soothra 52:-*Mandramadhyathaareshu kramena dwaigunyaal sruthaya:shadshashtirithi keshaanchidukthirapi pratyukthaa.*

In Marga and Dakshina the sruthi number is different . Mandra, Madhya and thaara are the 3 sthaayi. The effort for sruthi in Madhya is twice that of mandra , and that of thaara is twice that of Madhya . This is so in vocal music as well as in flutes etc. The number of vibrations per nimesha for Madhya is twice that of mandra , and that of thaara is twice that of Madhya . Thus effort as well as number of vibrations and sound waves are twice for each sthaayi starting from mandra to thaara . The cause makes the difference in effect. In one sthaayi 22 being number, in the 3 sthaayi there should be 66 sruthi according to some but this is illogical as described earlier. In Dakshina method with 24 sruthi in each sthaayi, total of 72 sruthi are there according to some. The answer to this is said in next soothra.

Soothra 53:- *Vyakthibhedamaathramavalambya vibhaage swaraanamapi thathaa vibhaagaapathe :anumandrathaaratharayoragananasya nirbeejathwaacha*

By difference in cause , the effect may change but there is no change in their jaathi (class). To make a big cloth and small cloth the amount of thread and the effort etc may differ but all cloths belong to the same class whether small or big. Similarly the sruthi in mandrasthayi and tharastahyi belong to same class. The sruthi in the same sthaayi have a difference between them like a cotton thread and a silk thread. Therefore there is samvada between some of them and vivada between others. This difference of sruthi is the same class in all sthaayi. All sruthi are in same order in all sthaayi. If we take that swara are like sruthi highly individualistic, we have to accept that they are not 7 but 21 in the 3 sthaayi. There should be names for each of them and ragabheda due to that stahyibheda. If we do not take anumandra and thaarathara as two sthaayi only mandra, Madhya, thaara are considered, it is illogical, and to say the number is 72 will not be correct.

Soothra 54:-*Atha chathurvimsathtyadhikaasthanmadhyagathanaadabhedaa api dakshine grihyanthe.Drisyanthe cha thalprayogo raagagamakavisesesheshu .*

In music of south India , in one sthayi there are 24 sruthi is also an illogical statement. The measure of a sruthi is that subtlest difference which can be distinguished by a scholarly trained expert's ear. (Abhinavaguptha). If we divide a sthaayi as 24 parts, each of the parts and its middle naada is experienced as different by the trained scholarly ear. Not only it should be distinguished, but should be useful in a raga . Then only it is sruthi in dakshina . In many dakshina regional music, the difference is distinguishable by means of different special gamaka etc and those antharanaada are useful and practiced in raga . Thus if there are 24 sruthi each can be divided again into many and each may be used in raga. This makes the division of sruthi meaningless and hence is illogical according to the author. The prayoga and gamaka of such internal naada of sruthi are given as examples.

Soothra 55:- *Ragaviseshe goudasaaveryaadaavrishabhasya kambojisankaraabharanaadou shadjadhaivathayo kalyaanaadou kakaleeprathimadhyamayoscha yathaayatham neechochabhaava:gamakeshu cha thriroopaadishu.*

In south Indian music there are 12 swara and 24 sruthi. Each have 2 sruthi which are equal. Thodi, Gouda, Saveri, Malavagouda etc have sudharishabha but that swara is not at the same position in these raga. In Thodi and Malavagouda it is second from shadja. Gouda and Saveri has slightly lesser than the second sruthi from shadja and is slightly higher than the first sruthi. Only then the pleasing nature of each raga will be brought out. Kamboji and Sankarabharana has a vikrithadhaivatha which is 2 and ½ sruthi higher than sudhadhaivatha . In sankarabharana for pleasing effect shadja is used ½ sruthi less or increased than its usual place. In kalyani for pleasing effect prathimadhyama and kaakalinishada are used as higher than its usual position. Only thus the life of the raga is obtained. When sruthi is 24, the internal nada of them become pleasing in any raga. In kedaragouda Ramamatya says kakalinishada is used while Venkatamakhi says it is kaisikinishada. Such quarrels arise because both were confused with the margi and dakshina systems of sruthi as alike. In practice the nishada of kedaragouda is pleasing, different from that used in suratti, and is slightly less than kaakali and slightly higher than kaisiki. This middle naada is misunderstood as kakali by one scholar and as kaisiki by another . In Bhairavi, Sankarabharana etc in avarohana order especially for pleasing effect each swara is spread upto 1/4th of the higher swara is called thriroopagamaka . This avantharanaadaprayoga is thus for ranjaka or pleasing effect. Such prayoga will not be possible if a sthayi is divided as 24 says some people. For this an answer is said in next soothra

Soothra 56:- *Uchyathe. Prayoganurodhaadhakshine nishkrishtasruthilakshanaanusaarena sthaayinyashtaachathwaarimsadeva sruthayomgeekaraneeyaa ithi sudhiya:*

In south Indian practice and according to lakshana given by Abhinavaguptha etc in one sthaayi 48 sruthi is accepted. This is the scholarly opinion. The words of Hanuman quoted previously also favour this view. For these sruthi there are parts , yet that difference is not discernible even to a highly trained person. This view of 48 sruthi is acceptable to scholars.

Soothra 57:- *Atha eva paadathripaadaswaravyavaharobhignaanaaam samgachathe*

A sruthi that is $\frac{1}{4}$ sruthi less and $\frac{3}{4}$ sruthi high than a specified sruthi has difference of $\frac{1}{2}$ swara. This become true when sruthi are 48. In 24 sruthi division 2 sruthi making one swara is literally 48 swara. Then $\frac{1}{2}$ sruthi = $\frac{1}{4}$ swara

1 and $\frac{1}{2}$ sruthi = $\frac{3}{4}$ swara

Just as varna is for a sentence , if the sruthi is the ultimate cause for sthaayi, and if that sruthi is again divisible, it cannot be the ultimate cause. $\frac{1}{8}$ swar, $\frac{1}{16}$ swara etc which is used by scholars of music then becomes illogical. Since swara in one sthayi is 12 , sruthi are 48. Any 7 naada in one sthaayi makes one special raga. The sruthi become at each instance the nada included in that swara and hence swara must also be 48. In one raga 12 swara does not come. 12 is the number of swara that is maximum possible in a said raga . The answer to this doubt is given in next soothra.

Soothra 58:- *Thathra laaghavaadyavyavahaare prathamadwittheeye poorvena sambadhyathe . Thritheeyaa thritharena.*

In practice all sruthi become different swara .To make a simplified practice it is decided that 4 sruthi makes a swara. First and second sruthi of a swara join with the previous swara. And hence named as a variant of that previous swara.

Prathimadhyama and kakalinishada in kalyani , vikrithadhaivatha in sankarabharana , though they are having more number of sruthi than the names suggest are designated as prathimadhyama, kakalinishada and vikrithadhaivatha . The 3rd sruthi join with the swara in 4th sruthi and designated as variant of that swara. Thus it is for simplicity of practice the rule that adding 4 sruthi a swara, and total 12 swara is fixed. The 2 sruthi before the said position of each swara and 2 sruthi after it, are designated by that swara means it is the middle of swara which is the position of swara in the rule .If the sruthi are 48 in south India , how can the names chathusruthirishabha and chathusruthidhaivatah for vikritha rishabha dhaivatha near shadja and panchama be called like that ? The doubt is cleared with next soothra

Soothra 59:- *Saamaanyatha: sruthidwayamekeekrityaabhignairvyavahriyatha ityathraapi thathaiva: viseshasathwe viseshokthi:*

Considering two sruthi as as one sruthi is the naming chathusruthirishabha etc .done. It is accepted by scholars and hence followed in this book. Wherever 48 sruthi are considered as sthaayi, in such special places it will be specially mentioned.

In Margi and Dakshina system in which sruthi 12 swarasthana are divided and the relationship of those swara and sruthi with the special Raga has to be learned. For that the opinions of ancient teachers are cited.

Soothra 60:- *Rananaathmikaa sruthiranurananaathmikaa swara ithi sphotaamsasya sruthithwaannaadaamsasya swarathwaathayorjanyajanakabhaava ithi nissamkaadaya:*

Sruthi is the sound first produced (Ranana) swara is the sound produced as a result of it, and follows it (anuranana) .Thus in naada or sound wave series the sphota part which is cause for the first wave form and the remaining waves is sruthi. The following part of naada which is the orderly series of waves are swara. Therefore sruthi is kaarana (cause) and swara is effect (karya) and their relation is cause and effect . Nissangasarngadeva has said this.

Sruthibhyassu:swaraa:sruthyanantharabhaaveeya:snigdhodhonurananaathmaka:

Soothra 61:- *Srutya swarobhivriyatha ithi swaraabhivyanjakathwam srutherithi mathangaadaya:*

The swara is manifested by sruthi. Like light of lamp manifesting objects around the knowledge of sruthi manifests the knowledge of swara. Therefore sruthi is the gnaapaka of swara and swara is gnaapya of sruthi. This is opinion of Mathanga.

Shadjaadayaswaraasapthavriyanthe sruthibhissadhaa andhakaarasthithaa yadwal pradeepena ghataadaya: abhivyakthishu sarveshaam nyaayya:pakshassathaam matha: Arthaapathyaanumaanena pratyakshagnaanathopi vaa grihyanthe sruthayasthaaval swaraabhivyakthihethava:

Soothra 62:- *sruthisswaraathmanaa parinamatha ityanye*

As gold transforms into bangles, earrings etc , or as milk turns into curd, each sruthi transforms into a swara according to others. Swara is the transformed form of sruthi.

Thus relation is that of parinaami and parinaama. *Sruthayaswararoopena parinamanthe yathaa ksheeram dathiroopena* (Kohala).

Soothra 63:-*Sarvaasaamapi srutheenaam yathaayatham swarathwaal sruthiswarayosthaadaathmyamevetyapare*

All sruthi become swara by difference in raga . That is , a person who attains a special status like kingship, ministership etc in sruthi which are in different positions the special dharma of swarathwa also is seen. There is no real transformation of form in sruthi which is heard as swara. Thus the relation is Thaadaathmya (abheda/advaitha) according to others. *Sruthayassyuswaraabhinna:sraavanathwena hethunaa ahikundalavathathra bhedokthi:(Paarijaatham)* The basis for such differences of opinion is now explained.

Soothra 64:-*Athra pakshathrayam*

tharangaparamparaaroopadwaneramsavibhaagena kalpitham

The first three opinions cited have taken the differences of parts of dwani in the form of sound wave series and decide sme parts are sruthi and others are swara. In opinion of Nissanga , sruthi is sphota part and swara is naada part. Mathanga's view says sruthi is vyangya (unmanifested) and since vyangya is different from vyanjaka(that which is made manifested) there is a difference accepted between swara and sruthi as two parts of dwani.The gold and the ornament (parinama theory) also accepts a difference in form between sruthi and swara as gold and its product. But in the opinion of Thaadaathmya (advaitha) such a division is not necessary

Soothra 65:-*Nadabhedagraha eva sruthibhedagrahopeethi na sphotaamsamaathrasya sruthithwam samgatham. Sruthiswarathwayorvyaapyavrithithwaacha*

In dwani with shot sound the sphota form , and that which is called ranana or the first wave is cognized. But with that cognizance the cognition of sruthi does not happen. Only when the anuranana part or naada also is cognized one gets the cognition of sruthi which is the part of a sthaayi. In cognizance of sruthi , importance is for cognizance of Naada part. Only when we cognize the difference between two such naada , we are cognizing sruthi. Therefore sruthi cognizance depends on anuranana or naada .This makes clear that the division of sruthi as ranana /sphota alone cannot be accepted. The cause and effect theory is thus negated. The dharma of sruthithwa and swarathwa are spread throughout the series of sound waves . It is like a cloth in which the dharma of cloth is spread in all the threads which criss-cross through it .In a single thread the dharma of cloth does not exist.In a series of sound

waves sruthithwa and swarathwa as dharma is not present in a single wave. Therefore there is no logic in dividing the series of sound waves into swara and sruthi .

Soothra 66:- *Aadhaarasruthiroopamanyasruthiroopam vaa*

naadabhedamavalambyaiva

swaraapaswarayornnirnayaadabhivyanjakathaamathamapi thaavanmaathre

sangatham na punasthathasruthiswarabandhe.

Thus to divide swara and sruthi as two parts of the orderly series of sound waves is illogical. Sruthi has got swaravyanjakathwa (it manifests swara). It is based on a adharasruthi for a Geetha which is the last sruthi of shadja, in a sthaayi , a special sruthi in the interval sruthi of any swara is fixed and based on that sruthi only the the swara /naada in a special raga are recognized and those that does not fit in, considered as apaswara. Therefore sruthi definitely has swaravyanjakathwa. The sruthi and swara develop a vyangyavyanjaka bhava for manifesting the other swara required for that raga , but it does not mean that each of the sruthi as dwani has a vyanjakathwa of that swara which is naada of that sruthi. The general cause for vyangyavyanjakabhava exist and for it the difference in the object also is a cause. Therefore this relationship also is not correct. Mathanga speaks only about the sruthi which is adhaarasruthi for a geetha only. (ekaiva sruthi). It is based on that sruthi the ladderlike sound pattern of swara and sruthi are formed. The interval sruthi between each swara has swaravyanjakathwa.

Soothra 67:- *Parinaameshuaakaarabhedasya niyathathwaal*

sruthiswarayosthadaprathetheermmatham thadapinajyaaya:

When gold become ornament and sand become pot , and milk become curd there is an object that is transformed into another form. There we find a change in form . The gold is ornament and pot is sand and this thanmayatha (oneness) does exist. Curd is transformed milk. Ashes are transformed fuel. But we don't feel that way. The difference in different types of transformation is that in some , the difference in form is felt and in others not felt .There must be a change in form as a law .But it is not felt .In the case of sruthi 's naada form and swara's naada form no difference is experienced. Sruthi is felt as swara itself by the quality of pleasing, and the continuity .Ornament kept in a box does not give beauty to face. When worn it enhances beauty. When one naada is in sruthi position and in swara position has only this difference. Therefore swara is the transformed form of sruthi is also not acceptable.

Soothra :- 68:- *Thasmaaschruthiswarayosthaadaathmyapaksha eva samgatha:*

Thus sruthi and swara are one , and by the quality of pleasing dharma sruthi itself acquires the dharma of swara is understood. This means they have thaadaathmya (oneness) and are abheda (not different). If there is a feeling that they are different, it is just because of quality in swara position which is an illusion. Sruthi and swara are the same individual. And sruthithwa and swarathwa are the genral and special dharma within that single individual. Thus there is unity. But the special nature is there which is explained.

Soothra 69:- *Iyaamsthu visesha:sarvaasu sruthishu*

kaasaanchidevaikadaaswarathwam .Sruthithwam thu sarvadethi.

Though swara and sruthi are one individual, there is a special feature. Sruthi are orderly sound wave series with difference due to their high or low nature. In the many series of naada in one sthaayi these series of sound waves can be 22 or 24 or 48

according to different opinions. But the pleasing (ranjakathwa) nature does not exist in all of them at the same time (simultaneously). Only in some sruthi sound series we get this quality of swarathwa at same time. The general dharma of sruthithwa is always present in all of them at all times. Except in some gamaka usages , in two nearby sruthi , swarathwa dharma will not come at the same time.

Chapter 3 Swaraprakaasa

Yo leelaya vividhayaa jagadranjayathi swayam

Tham vande baalagovindamaanandamayavigraham

Soothra 1:- *Swayam ranjayatheethi swayam raajatha ithi vaa swara:*

The meaning of the word swara is that which naturally pleases. Even without the meaning etc it produce pleasure in the listener's mind. In each raga , the swara like shadja etc with their graham, amsa, mandra , thaara are united in their own natural quality and therefore this pleasing nature. Swayam has the first letter Swa and Ranjayathi has its first letter ra and a combination makes swara. Nissangasarngadeva says : swayam swaraajathe yasmaathamaadesha swara: smritha: That which is revealed by itself or that which is bright and naturally enlightening. The pure and vikritha (artificial) swara in the veena reveal themselves in their swayambhoo positions like this. Mathanga says : swayam yo raajathe yasmaathasmaadesha swara: smritha:

Soothra 2: *Swaryathe srutyaa aakshipyatha ithi vaa swara:*

That which is known by assumption or guess (aakshipyatha) is swara. Swaryathe means akshipyathe or understood by assumption. Dhaathu is swara aakshepe. Since the context is music, by sruthi , is also understood. The adharasruthi which begins a sthaayi , or by any other said sruthi, based on which one can discover or cognize is the meaning.

Soothra 3:- *The cha*

shadjarshabhagandharamadhyamapanchamadhaivathanishaadaakhyaa :sthaayinyekasmin saptha:

In one sthaayi there are always 7 swara. Their names are shadja, rishabha, gandhara, madhyama, panchama, dhaivatha, nishada. In moorchana, thaanam, alamkaram etc also shadja is taken as the basic fundamental. In south Indian music, the beginning shadja, and the ending shadja are included and thus 8 swara are counted. Even Bharatha who has started the order starting from Rishabha says:- *Shadjascha rishabhaschaiva gandharo madhyamasthathaa*

Panchamo dhaivathaschaiva sapthamascha nishadavan

Therefore shadja is adharasruthi. Mathanga has described the meanings of these seven sounds denoting why they are named like this.

Shadjanakam (that which give birth to the other 6 swara) is shadja. Risha is a dhathu which means gamana or going up. From Rishabha swara onwards the upward movement in a sthaayi starts . Gandhara is that which can carry a gaana (song). Since a gana or song is made only when there are 3 swara, the 3rd swara is the one that carry the song . Madhyama is that which is in the middle. Panchama is that which is 5th. Dhaivatha is that which pleases the intelligentia immensely. Nishada is the last among the swara .

In margi according to Bharatha and Mathanga there are 10 swara positions, and according to Nissanga there are 14, and in south Indian music there are 12 positions in a sthaayi .Then how do you say that swara is only 7 ? Answer to this doubt is given.

Soothra 4:- *The thu sudhaa vikrithaa misraa vaa*

The 7 swara can be ure, artificial or a mixture of both. Therefore , even if there are 10,12 or 14 swara in a sthaayi only 7 among these will be used in any one particular raga. Therefore there are only 7 swaras practically .In south Indian music, there are no artificial shadja or panchama. Therefore there are 7 pure swara and 7 mixed swara .In marga even these two have artificial forms and all swara in artificial form can come.

Soothra 5:-*Sudhathwam cha marge bharathaadibhi :samkethena*

poorvasudhaswaraachathurthasrutyaadishu vyavasthaapithathwam paaribhashikam. Yathaa chathusathusathusathuschaiva shadjamadhyamapanchamaa: dwe dwe nishadagandharou thri three rishabhadhaivathe ithi

In marga the pure swara are made into 22 sruthi .Bharathamuni has attributed a place for each of them in a sruthi. In that for shadja,madhyama,panchama(3 swara) 4 sruthi each; for nishada, gandhara 2 sruthi each; for rishabha, dhaivatha 3 sruthi each .Therefore from shadja , in the third sruthi is rishabha, and from it in 2nd sruthi is gandhara, from it in 4th sruthi madhyama, from it the 4th panchama, and from it the 3rd dhaivatha, from it the 2nd nishada and from it the 4th is next shadja. This is the order of pure sounds as swara. The order is based on the dhvani in samaveda called krushta,prathama,dwitheeya,thrithheeya,chathurtha,mandra,athiswara etc.

Bharathamuni has said : *Saamavedaadidam geetham sanjagraaha pithaamaha*:The shadja that comes in 2nd sruthi after the artificial kaaakalinishada, rishabha that comes in 4th sruthi after chyuthashadja have no position change from pure swara positions, yet in margi they are not considered as pure swara.

Soothra 6.*Dakshine thu samaanasrutyantharavibhaktheshu*

poorvasudhasannihithaananthara swarasamjnithaprathamawarathwam.

In south India sruthi are in 12 swara positions which are equally divided and that swara which comes first after a ure sound but with the name of the second sound is also a pure swara. In one sthaayi 12 swara positions are possible. But Venkatamakhi has not divided the sruthi into 12 equal parts , and the author Aattoor thinks since his division is based on illusions it need not be considered. In marga , chyuthashadja (one sruthi less than shadj) is nearer to the earlier pure sound nishada than shadja Chyuthapanchama is nearer to madhyapanchama than panchama. In other swara and sruthi also the law is like this. The lakshana of artificial swara is now said

Soothra 7:-*Yathaayatham thadanyathwamubhayasmin vikrithathwam*

All swara which are not pure swara in margi and dakshina are called vikritha or artificial swara.Since in Margi the number law of sruthi from earlier pure sruthi is very important in the lakshana of sudhaswara, due to that lakshana itself in the pure swara positions itself artificiality comes due to artificiality of earlier swara. That is if a pure swara comes after a vikrithaswara, even if it is in pure position, it becomes artificial. That is why the shadja at pure shadja position which comes after kaakalinishada becomes a artificial swara called chyuthashadja in the opinion of Nissanga. To become pure there should be 4 sruthi difference. After kaakali there is

only 2 sruthi. After chyuthashadja , rishabha in pure rishabha position, become artificial called chathusruthikam. To be pure rishabha should have only 3 sruthi difference. After chyuthashadja it has 4 sruthi difference. According to Bharatha, the law of number of sruthi of pure swara after a earlier swara is the reason for this. But for no swara , even in Marga a difference of more than 4 is not accepted. Therefore after chyuthamadhyama(pure madhyama – 1 sruthi) a chyuthapanchama with three sruthi, and not a pure panchama at pure panchama position, will come. Since different swara with one sruthi difference will not come as bhinnaswara united the swara at pure panchama position will never become artificial. This is the system of artificial swara in margi. In dakshina, according to its lakshana of pure swara, the swara with the same name that comes at pure swara position will not be artificial. That means whatever is the earlier swara the shadja at pure shadja position and rishabha at pure rishabha position will not be artificial. The earlier swara even if it is sudhanishada or kaakali , the shadja after it will always be pure .But if in a sudhaswara position , another swara comes that will become the artificial swara with the name of the earlier swara. Thus gandhara whether sadharana or anthara , the swara at position of pure gandhara will be artificial with name panchasruthikarishabha or chathusruthikarishabha . Nishada whether kakali or kaisiki become artificial with the name shadsruthidhaivatha. These are the opinions of Venkatamakhi, Ramamatya and Govindacharya. But the basis for their opinion is not the difference in sound (naada) which creates difference in Raga , but the difference in names . There should be name difference as there is difference in sound is given in sruthiprakasa. Based on difference in nada, the the pure and artificial differences of a swara mixed, also raga are produced. Therefore in raga, swara with different names will create more confusion. In Bharatha and Mathanga , the sadharana and antharagandhara are same swara, sudhanishada and kaisikinishada are same swara .There is no need to classify them as two positions and give 2 names. In a system where sthaayi is divided into 22 sruthi, pure nishada position that comes at 5th sruthi from panchama and pure gandhara position that comes 5th from pure shadja , and in sthayi divided into 24 (dakshina) since 6 sruthi each which are equal comes, pure nishada and pure gandhara are same , margi and dakshina have no difference at all. Therefore no need to change pure nishada to chathusruthidhaivatha position (artificial) or pure gandhara to chathusruthi rishabha . Thus rishabha ,gandhara, madhyama and dhaivatha , nishada each are pure , artificial and this is the best opinion logical for the original causal margi and to dakshina .For the 7 swara different names are shown.

Soothra 8:-*Theshaam kramaal sarigamapadthaneethi gaanarthaa laghusamgnaa*
For music and practice the short abbreviation of sa, ri,ga,ma,pa,dha,ni are used. This is from the first letter of each of the seven swara names said earlier. Sha of shadja (sha is moordhanya –uttered with the head) and sa (dantya pronunciation – with teeth) is different apparently and is easier to pronounce and in Sanskrit these letters come near and shree and see are exchanged in Sanskrit language pronunciation. The earlier name for shadja was sajja or sadaja according to many. Sajja is that which makes other swara ready to be originated from it. Sadaja is that which originated from the sad or truth (as the first swara from the Nadabrahman). Himsa is a word that became simha , and marakatha became marathaka .Like thatsajja became shadja in time. These are due to evolution of language. Ri in rishabha also is easy for

pronunciation. The varna e in Re (ri) became condensed and vivritha to become the RU swara of language (as in Rushabha) says varnaniruktha. 2 letters join to form aa. Gaa in gaandhaara is shortened to ga in sariga . ma,pa,ni are first letters of madhyama,panchama and nishada. Ai is a united letter with a(pronounce as amma) and e (pronounce as A of English language)Dhaivatha has this swara.It is removed to get dha.

Soothra 9:- *Thathra maargeeyasudhaanaam sruthiniyamo vivrutha: thathra vikrithaasthu bhinnasthaanagatha anyasthaanagathaascha*

There are fixed numbers for each swara. Those at artificial places were also discussed as 2 types. Those that come after a artificial one and those that come at a place which is not its place and is different in the number of sruthi .

Soothra 10:- *Theshu bhinnasthaanagathaa shadjamadhyapaanchamebhya ekaikasruthichyuthaaschuthuthashadjaadisamgnithaastharaya:kaakaliantharouchethi pancha keshaanchil praachaam mathe .*

In those artificial swara , the artificial coming not in other swarasthaana, are 5 according to some and they are chyuthashadja,chyuthamadhyama and chyuthapanchama, one sruthi less from shadja,madhyama,panchama(with 4 sruthi difference);kakalinishada and antharagandhara. According to them,for pure swara 7, and for artificial 5 each , in a sthaayi 12 different positions are present.

Soothra 11:-*Nissangaadayasthu sadharanakaisikaakhyou sudhaabhyaamekasrutyantharithou krithwaa saptha bhinnasthaanagavikrithaanaahu:* Nissangasarbgadeva says sadharanagandhara is one sruthi above sudhagandhara and , Kaisikinishada is one sruthi above sudhanishada.

Sadhaarane thriruthi:syaadantharathwe chathusruthi:

Gandhara ithi thadbhedou dhou nissangena keerthithou

Kaisike kaakaleethwe chanishadasthrichathushruthi:

Praapnothi vikrithou bhedou dwaavithi

From rishabha third sruthi is gandhara.In 4th sruthi antharagandhara. Thus there are two artificial types of gandhara according to Nissanga . From dhaivatha 3rdsruthi kaisiki and 4th sruthi kaakali. Thus for nishada also two artificial forms. According to this opinion ,Somanaatha also took positions of sadharana and anthara gandhara as different .

Saadharanontharascha sruthim sruthee chaitya go masya

Ni:kaisiki cha kaakali atha sasyaikaam bhajamscha thaam the dwe (Somanatha)

Gandhara taking one sruthi of madhyama (with 4 sruthi) become sadharanagandhara, and taking 2 sruthi become antharagandhara. Nishada from shadja (with 4 sruthi)taking one sruthi become kaisiki and 2 sruthi become kakali.

Thus in opinion of Nissanga etc , those that come not in pure swara positions are 6th sruthi from shadja(sadharana ga),in 7th sruthi antharagandhara,in 8th chyuthamadhyama,in 12th chyuthapanchama,in 19th kaisikanishada,in 20th kaakalinishada. In this way in margi there are 7 artificial swara. In one sthaayi 7 pure positions and 7 artificial positions make 14 swara positions. Since antharagandhara is only another name for sadharanagandhara , and sudhanishadaa nd kaisiki are different names of the same swara, there are only 12 swara positions according to teachers like Bharatha. The antharagandhara (4th fromrishabha) and chyuthamadhyama will not come together.The kakalinishada andchyuthashadja also will not come together.If

sadharanagandhara is one sruthi less from antharagandhara and is an artificial one, then it can come with chyuthamadhyama in a prayoga. Similarly in case of kakali and chyuthashadja. Nissanga himself have said :

Chyuthochyutho dwidhaa shadjo dwisruthirvikritho bhavel

Saadhaarane kaakaleethwe nishaadasya cha drisyathe

That is artificial shadja are chyutha and achyutha . Each have 2 sruthi difference . If nishada goes above shadja , it is chyuthashadja. If it is kaakalinishaada it is achyuthashadja. Similarly, the 3rd sruthi from sudhanishada is chyuthashadja and to be with 2 sruthi difference it has to come in 1st sruthi after pure .That is kaisikinishada. In the same book the state of gandhara is shown likewise.

There is a general law that swara with one sruthi alone in between them will not come in raga prayoga. Minimum 2 sruthi difference should be there. It is applicable to all pure and artificial with same names , and for different names.

Chyuthachyuthamadhyama , and chyuthachyuthashadja will not come together.

Antharachyuthamadhyama and kaakalichyuthashadja also will not come together. For this no particular law is needed. To artificial shadja and madhyama, artificial nishada and gandhara are not united and used (in Bharathamuni) and therefore no need to change position of sadharanagandhara and kaisikinishada and make them special artificial. Kalleenaatha, the commentator of Nissanga has commented the book, without making it contrary to the views of Bharatha. Amatyan and Venkatamakhi who say only 12 swara positions in Dakshina system , became confused by the book of Nissanga. The most logical law is the ancient law .Now, about artificial swara that come in the position of other swara.

Soothram 12:- *Anyasthaanagaasthu kaakalyantharaparou dwisruthikou shadjamadhyamou chyuthashadjamadyapanchamaparaaschathusruthikaa rishabhakaisikapanchamaadhaivathaaschethi pancha.*

Anyasthaana means the position of another swara. In maargi there are other artificial swara which come in place of another swara. That swara can either be a pure or artificial one. In margi, the law is that the number of the sruthi or sruthisamkhyaa is the reason for sruthibheda or difference in sruthi – of difference in names of swara and for difference in purity and artificiality. Even if there is no difference in Naada it becomes artificial and with a different name, in case the sruthisamkhyaa change from the earlier one. The artificial swara which has no such position change are the achyuthashadja , after kakalinishada with just 2 sruthi difference at position of sudhashadja. To become pure shadja 4 sruthi difference is needed. After antharagandhara with 2 sruthi difference in position of pure madhyama is achyuthamadhyama. To become pure madhyama there should be 4 sruthi difference.

After chyuthashadja, used as chathusruthirishabha is at the same place as Sudharishabha. For sudharishabha only 3 sruthi difference is needed. After chyuthamadhyama, chyuthapanchama at the thrisruthipanchama position with 4 sruthi difference is kaisikipanchama. After chyuthapanchama at pure dhaivatha position, chathusruthidhaivatha with 4 sruthi difference. These are the 5 .

Thus according to Nissanga there are 7 at different position and 5 in anyaswara position making 12 artificial and these 12 with the seven pure makes 19 swara.

Somanathan does not consider the 5 artificial which have no naada difference.

Therefore he has only 14 swara. *Ithi sapthokthaa: sudhaa vikrithaan sapthaiva vachmi*

sahanaamnaa and dwaadasavikrithaan poorve vadanthi thathra thu prithak prithak dwanitha :sapthaivaswarbinnaa na pancha yadime samadhwanyaya: are words of Somanatha. Aattor thinks this is more logical than the opinion that there are 12 artificial swara. Because in practice only this much of differentiation is needed . All the swara that come in position of sudhaswara can be considered as sudhaswara themselves. Whether the number of sruthi increase or decrease in between , the Nada in the positions determined does not change in practice. Thus only those swara which have position difference from pure swara need be considered as artificial.

Soothram 13:- *Jaratharaasthu kaakalyantharaaveva moorchanaadyanurodhena vikruthou vadanthi. Graamaviseshehena chyuthapanchamasya sudhathwam cha .*

If we examine the opinion of Bharathamuni , we find that Chyuthapanchama is the pure swara of madhyamagrama. The use of that swara does not come in shadjagrama. In madhyamagrama, the chathusruthipanchama of shadjagrama does not come. The reason for classification into the different grama itself is this difference in panchama. Therefore chyuthapanchama cannot be regarded as an artificial swara. If we do so, based on madhyamagrama , the panchama of shadjagrama also will become artificial.

*Shadjaschathursruthigneya rishabhasthrisruthisthathaa
Dwusruthischaiva gandharo madhyamascha chathusruthi:
Chathusruthi:panchamassyaadhaivathasthrisruthisthathaa
Nishaado dwusruthischaiva shadjagrama bhavanthi hi
Chathusruthisthuvigneyo madhyama:panchama:puna:
Thrisruthirdhaivathasthu syaachathusruthika eva hi
Nishadashadjou vigne you dwichathusruthisambhavou
Rishabhasthrisruthischa syyad gandhaaro dwusruthisthathaa*

That is how Bharathamuni has classified pure swara based on difference in Grama. Therefore in ancient Desi opinion which was given above, we will have to change chyuthapanchama (shown as artificial among the 5) into the group of pure swara. The other 4 are not considered as separate swara in use of chyuthashadja and chyuthamadhyama. They are considered only as a variant usage of pure shadja and madhyama. Anthargandhara and kakalinishada with 2 sruthi difference alone are thus special artificial swara in desi . That is why in the moorchana prakarana they alone are taken for special moorchana and thaana. Thus chyuthashadja, chyuthamadhyama moorchana and thaana are not mentioned in that prakarana by them. Both Mathanga and Bharatha are of this opinion. *Evamethaa kramayukthaa : poornaa :shaadavoudaveekrithaa:saadhaaraneekrithaaschethi chathurvidhaaschathurdasa moorchanaa:*

*Kramayukthaa swarasapthamoorchanaasthwabhisamgnithaa;
Shadpanchakaswaraasthaam shaadavoudavithaa: smrithaa:
Saadhaaraneekrithaaschaiva kaakaleesamalamkrithaa:
Antharaswarasamyukthaa moorchanaa graamayordwayo:
(Bharatha)*

*Thathrasapthaswaramoorchanaa chathurvidhaa.
Poornaa shaadavaa oudavithaa saadhaaranaa chethi
Thathra sapthabhi:swarairyaa geeyathe saa poornaa
Shadbhi :swarairyaa geeyathe saa shaadavaa:*

Panchabhi:swairiyyaa geyathe saa oudavithaa

Kaakalyaantharaswaraiyyaa geeyathe sa saadhaaranaa (Mathangamuni)

In shadjagrama and madhyamagrama 7 each moorchana making 14 moorchana .Each of these can be poorna,shadava,oudhava and sadharana When all 7 swara are used it is Poorna (Which we use in Melakarta raga). 6 swara make shadava. 5 swara make oudhava. That which has kakalinishada, antharagandhara either alone or both together is saadharaneekritha. Bharata has said that kakali nishada and antharagandhara alone are artificial swara. Nissangasarngadeva who speaks of several types of artificial swara in swaraprakarana, when he deals with moorchanaprakarana says only kakali and anthara are the causes for difference in moorchana .

Chathurdhaa:thaa :prithak sudhaa:kaakaleekalithaasthathaa

Saantharaasthadwayopethaa:shadpanchaasaditheerithaa:

So even he admits these 2 alone for difference in moorchana. Thus according to most ancient authors like Bharatha and Mathanga in shadja and madhyama graama 8 pure and 2 artificial swara makes up 10 swara in a sthaayi .

Soothra 14:-Mathabhedaasthwime pradarsyaanthe mandalaprasthaara:

To demonstrate easily the differences between these 2 opinions , mandalaprasthaara begins .Mandala means a field .

Maargeeyaswaramandala :

1.Bharatha :

Artificial	Sruthi	Pure Sa
	1	
	2	
	3	Ri
	4	
	5	Ga
	6	
Saad.Gaa; anthara gaa.	7	
	8	
	9	Ma
	10	
	11	
	12	Madhyamagramapanchama
	13	Shadjagramapanchama
	14	
	15	
	16	Dha
	17	
	18	Ni
	19	
Saad Nish;KaakaliNi	20	
	21	
	22	Sa

2.Praacheenaikadesi opinion :-

Artificial	Sruthi	Pure Sa
	1	
	2	
	3	Ri
	4	
	5	Ga
	6	
Antharagandhara	7	
Chyuthamadhyama	8	
	9	Ma
	10	
	11	
Chyuthapanchama	12	
	13	Pa
	14	
	15	
	16	Dha
	17	
	18	Ni
	19	
Kaakalinisahda	20	
Chyuthashadja	21	
	22	Sa

3.Opinion of Nissanga :-

Artificial	Sruthi	Pure Sa
	1	
	2	
Chathusruthirishabha	3	
	4	
	5	
Sadharanagandhara	6	
Antharagandhara	7	
Chyuthamadhyama	8	
Achyuthamadhyama	9	
	10	
	11	
Chyuthapa;kaisikipanchama	12	
	13	
	14	
	15	
Chathusruthidhaivatha	16	

	17	
	18	
Kaisikinishad a	19	
Kakalinishada	20	
Chyuthashadja	21	
Achyuthashadja	22	

3. Nissankha opnion :-

Vikritham	Sruthi	Sudham : SA
	1	
	2	
Chathusruthi	3	Ri
	4	
	5	Ga
Sadha>Gaandharam	6	
Antharagandharam	7	
chyuthamadhyamam	8	
Achyuthamadhyamam	9	Ma
	10	
	11	
Chyu.Pa;Kais.pa	12	
	13	Pa
	14	
	15	
Chathus>dhaivatham	16	Dha
	17	
	18	Ni
Kaisiki nishadam	19	
Kaa nishadam	20	
Chyuthashadjam	21	
Achyuthashadjam	22	Sa

4 Somanatha opinion :-

Vikritham	Sruthi	Sudham Sa
	1	
	2	
	3	Ri
	4	
	5	Ga
Sa Ga	6	
Anthara ga	7	
Mridu madhyamam	8	
	9	Ma
	10	
	11	

Mridu panchamam	12	
	13	Pa
	14	
	15	
	16	Dha
	17	
	18	Ni
Kai ni	19	
Kaa ni	20	
Mridu shadjam	21	
	22	Sa

Such prayoga with Margiswara alone became almost extinct with time.

Soothram 15:

Nashtapraayoyam maaargaswaraprayogo drisyathe keraleshu slaakhyaakhyaanaam naatakaabinayeshu sopanamaargaakhyadevasthuthishuchaamsamaathrena

This Margi swara based on shadja and madhyamagrama became extinct with time in Kerala. Parts of it are still used in the Kootiyaatta of Chakkiaar , which is a dramatic presentation, in their Dakka, and Mriddani instruments and also in sopanasamgeetham , a type of praise of God in temples. The sudha and vikritha swara of dakshina prasthaana is now explained

Soo: 16

Dakshine thu shaadjagraamikaa eva swaraa:

In South only the swara based on shadjagrama is present now. Therefore the swara for that grama alone is there .

Soo:17: *Thathra dakshinepi dwaavimsathisruthivibhaagamavalambya swaraan vibhajathaamamaatyavenkataadwariprabritheenaam matham thadasaangatyam cha sruthiprakaasa eva vyaakhyaatham*

In south also a sthayi is divided into 22 sruthi , and like margi sudharishabha and sudhadhaivatha having 3 sruthi each is the division of Ramamatya and Venkatamakhin. The author says it is not logical . He says he has described it in sruthiprakasa. (But here the author is totally wrong. In south , just as Bharatha has divided the 7 swara and 22 sruthi are followed in karnatic music . That is the mathematical permutation combination formula of India well accepted by all mathematical and musical traditions and South India , especially Kerala being a mathematically evolved place has no chance to deny it..The loss of certain types of music patterns with time does not mean that it never existed or will never come back and a mathematical perfect model will always be accepted by logical intelligence).

Soo:18: *Ayameva hi nissankaadimathamaargaathanmathe visesha: yal kaakalyantharaprathimaanaam chyuthashadjamadhyamapanchamasthaanarohanam sudhagandharasadharanagandharayo:shadjaavyavahithotharathaayaam sudhakaisikanishadaayo:panchamaavyavahithotharathayaam cha panchamasruthikarshabhaadisamgnaa kalpanena vikruthaswarasamgnaadhikyam cha*

The difference between what Amatya and Venkatamakhin said about south Indian swara and what Nissanka said about Margi swara is only this : The chyuthashdjam, chyuthamadhyamam ,chyuthapanchamam of Marga were discarded in South and a ascend for kakalinishada and antharagandhara at 2nd sruthi from sudhanishada and sudhagandhara to the 3rd sruthi of chyutjashadja, chythamadhyama was given and to place of chyuthapanchama kaisikamadhyama which is famous for dakshina 9(south India) . Thus in Nissanka from 7 vikrithaswara 3 were discarded and other 3 were used .But kaakalinishada antharagandhara positions became vacant and thus vikruthaswara became 5 .Sudhaswara remained as before thus bhinnaswara became 12. Then what Amatya etc did was in prayoga , after shadja without sudharishabha , sudhagandhara was used and among sadharana,antharagandhara only one comes , that sudha gandhara has no nadabheda , yet is named as panchasruthirishabha ,Similarly when sudharishabha or gandhara does not come next to shadja, and sadharanagandhara comes that is called shadsruthirishabha. This way shadsruthidhaivatha is a renaming of kaisikinishada. The 3 gandhara of nissanga first 2 are with rishabha names and among 3 nishada the first 2 have dhaivatha names .In this way 16 swara are obtained . (The author thinks it is the name that has changed and the mathematical integer function and its wave and vibration difference he does not understand properly .)

Sooth:19 .*Somanaathasthu deseeyepi dwavimsathisruthi:sudhaswaraamscha maargaanurodhenaamgeekrithya vikritheshu param viseshaanaaha*

Somanatha, the author of agavibodha without remembering the fact that even in desi there are equal sruthi, gives 22 sruthi like margi . Thus thinks the intervals between sruthi in desi is same as that of margi. He says some special laws for vikrithaswara which will now be explained

Sooth 20 thathra suddhaathekasruthiheenaanaam
mridupoorvaa,ekadwisruthyadhikaanaam kramaattheevratheevratharapoorvaa
thrichathusruthyadhikaanaam theevrathamapoorvaa thathalswarasamjnaa
thaduprajnaa

From one sudhaswara, one sruthi less ,add mridu in front of that sudhaswara. Eg mrudushadja, mrudumadhyama etc.if it is one sruthi more, call theevrarshabha, theevraganndhaara etc. if 2 sruthi above theevratharamadhyama,theevratharanishada, if 3 sruthi more or 4 sruthi more theevrathama is added in front.mridu is instead of chyutha in margasamgeetha.in shadja and panchama, since in shadjagrama they have no vikruthaswara, such additions are not needed for these 2 sudhaswara names.the rihabha and dhaivatha less than 3 sruthi is not accepted by that author.therefore mridu does not happen to these 2 swara.

Sooth 21 atha cha chathushpanchashadsruthikaan
theevratheevratharatheevrathamaabhyaam sthreenrushabhaam sthaadrusaam sthreen
dhavathan shadsruthikow theevrathamagandharamadhyamou chethyashtou
vikruthaan maargaadhikaanaaha.theshu theevratharatheevrathammarshabhau
sudhasaadhaaranaganndharraabhinnanaadou thaadrusaidhaivathou
sudhakaisikanishaadasamanaadou shadsruthigaandhaara
sudhamadhyamasamanaadaschethi chathusruthikam theevramrishabham
thathaavidham dhaivatham shadsruthikam theevrathamam chethi threen vikruthaan
vibhinnadwaneen maarggokthaadhikathayaa cha vadathi.

Theevrarshabham with 4 sruthi difference, theevrathararishabha with 5 sruthi difference, theevrathamarishabha with 6 sruthi difference
 Three daivatha like that
 Theevrathamagandhara with 6 sruthi difference
 And similar madhyama with 6 sruthi difference
 These 8 vikruthaswara are additions in desi (absent in margi). After that among them panchasruthika theevrathararishabham is of same nada as sudhagandhara. Shadsruthika theevrathamarishabha is same nada as sadharana gandhara. panchasruthika theevratharadhaivatha and shadsruthika theevrathamadaivatha are sudhanishada and kaisikinishada respectively. shadsruthika theevrathamagandhara is sudhamadhyama. Thus from 8 vikruthaswara 5 are equal to another sudhaswara or vikruthaswara. Avoiding this the 3 which come in different positions are chathusruthi theevrarshabha, chathusruthi theevradhaivatha, shadsruthi theevrathamagandhara, (only 3).

Ridhaya : parasruthigadeschathasra iha panchashad thathaa sruthaya:
 Deseeraageswabhiveekshyanthe thaa: shad thathaa gamayo:
 Ithi theshu sambhavanthi thrayonya ebhyo vilakshana vikruthaa:
 Panchasruthi: sucherggalsadharanagaaccha shadsruthika:
 Riranna prithakthaadyagdhho ne :kaisikaanescha: shadsruthirggo maal
 (somanatha)

Shadsruthimadhyama here is 2 sruthi above sudhamadhyama. Then it should be theevrathamadhyama by name. yet since with 5 sruthyanthara vikrutha are theevrathama it is called by that name. Thus according to this sudha, theevra, theevrathara, theevrathama are rishabhadhaivathagandhara. (4 each). sudha, theevra, theevrathara nishadham (3 types)

Sudha, theevrathama madhyama (2 types) shadja and panchama makes a total 19 swara. sudha 7, vikrutha 12. among vikrutha, those which come in position of sudha ga, ma, ni

Sa ga, kai ni are vikrutha and in their position vikrutha rishabha and dhaivatha 5 Chathusruthi theevra ri, anthara ga, shadsruthi theevrathama ma, chathusruthi dha, kaakali ni – thus those without different sthaana -5.

To prove these are there in desi, in sriraga ri and dha are chathusruthi

Mallaari (sankarabharanam) they are panchasruthika

Sudhanaatta they are shadsruthika

In saranga the ga and in varali the ma are shadsruthika.

About the rishabhadhaivatha with less than 3 sruthi difference somanatha also does not mention like venkatamakhin. Then what is the reason for their use in thodi and gouda is not explained. In short, the first 2 sruthi of sudha rishabha and dhaivatha, the next sruthi of panchama (5 positions) being avoided, in 17 positions we get 22 swara. Of these sudha are in the same position as margaswarasthana (7). Vikrutha are 15. This is view of somanatha. Now we will show Ahobila opinion.